A UNITED STATES DEPARTMENT OF COMMERCE PUBLICATION

SOLAR-GEOPHYSICAL DATA
(prompt reports)

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Environmental Data Service

JANUARY 1974

NUMBER 353-PART I
DATA FOR
DECEMBER 1973
NOVEMBER 1973

U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, Secretary
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Robert M. White, Administrator
ENVIRONMENTAL DATA SERVICE
Thomas S. Austin, Director

Solar - Geophysical Data

NO. 353 JANUARY 1974

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DATA FOR
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NATIONAL GEOPHYSICAL AND SOLAR - TERRESTRIAL DATA CENTER
BOULDER, COLORADO

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SOLAR - GEOPHYSICAL DATA

No. 353

Issued in two parts

Hope I. Leighton, Editor

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Solar - Terrestrial Data Services Division

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SGD 353 Part I (Prompt)

DECEMBER 1973 DATA

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For explanations of the data contained herein see "Descriptive Text" published as supplement to February 1973 "Solar-Geophysical Data" (Number 342).

ALERT PERIODS

INTERNATIONAL URSIGRAM AND WORLD DAYS SERVICE

DECEMBER 1973

DEC. 1973	TIME OF ISSUE UT	ADVANCE GEOPHYSICAL ALERT	WORLDWIDE GEOPHYSICAL ALERT	
			NO.	TYPE INCLUDING FLARE ACTIVITY EXPECTED
01	0400			SOLNIL FOUR QUIET
02	0400			SOLNIL THREE QUIET
03	0400			SOLNIL S13W69 ERUPTIVE ONE QUIET
04	0400			SOLNIL TWO QUIET
05	0400		05651	MAGALERT 04/05 NO SPOTS VISIBLE
06	0400		06652	MAGSTORM ENDS 05/1200Z NO SPOTS VISIBLE
07	0400			SOLNIL NO SPOTS VISIBLE
08	0400			SOLNIL NO SPOTS VISIBLE
09	0400			SOLNIL ONE QUIET
10	0400			SOLNIL ONE QUIET
11	0400			SOLNIL ONE QUIET
12	0400			SOLNIL FOUR QUIET
13	0400			SOLNIL THREE QUIET
14	0400		14653	MAGALERT MINOR 14/15 SOLNIL THREE QUIET
15	0400		15654	MAGALERT MINOR 15/XX ONE QUIET
16	0400		16655	MAGNIL SOLNIL TWO QUIET
17	0400			SOLNIL S17E75 ERUPTIVE TWO QUIET
18	0400		18656	SOLALERT S19E62 ERUPTIVE THREE QUIET
19	0400			SOLNIL S16E49 ERUPTIVE THREE QUIET
20	0400		20657	MAGALERT 22/23 S19E32 ERUPTIVE THREE QUIET
	0835	BOULDER MAGSTORM BEGINS 20/0350Z MINOR RECURRENT STORM 20/0835Z		
21	0400		21658	SOLALERT S18E19 ERUPTIVE TWO QUIET
			21659	MAGALERT 21/22
22	0400		22660	MAGSTORM EXISTS MINOR
			22661	SOLALERT S16E03 ERUPTIVE TWO QUIET
23	0400		23662	MAGSTORM EXISTS MINOR S18W10 ERUPTIVE TWO QUIET
24	0400		24663	MAGSTORM EXISTS MINOR FOUR QUIET
25	0400		25664	MAGSTORM MINOR ENDS 23/2100Z SOLNIL FOUR QUIET
26	0400			SOLNIL FOUR QUIET
27	0400			SOLNIL THREE QUIET
28	0400			SOLNIL TWO QUIET
29	0400			SOLNIL NO SPOTS VISIBLE
30	0400			SOLNIL NO SPOTS VISIBLE
31	0400			SOLNIL NO SPOTS VISIBLE

RELATIVE SUNSPOT NUMBERS

ZURICH, R_Z

1973 PROVISIONAL

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	45	7	40	65	24	8	26	36	89	68	31	46
2	53	17	38	79	46	8	25	28	129	66	33	20
3	55	22	35	93	64	16	29	21	135	52	23	24
4	60	21	32	93	77	14	24	28	127	50	20	0
5	72	41	22	75	92	7	32	34	108	44	0	0
6	83	32	32	75	68	16	44	40	84	38	0	0
7	66	34	38	76	82	37	46	42	77	70	0	0
8	60	53	50	71	52	34	44	40	72	22	0	7
9	70	60	53	68	30	28	34	38	75	23	0	8
10	55	61	67	65	25	35	30	27	62	8	0	16
11	52	59	69	62	26	60	23	23	42	0	7	9
12	32	80	92	46	18	58	14	0	27	0	0	9
13	35	83	79	41	7	52	15	0	0	8	9	8
14	15	85	78	37	7	51	9	0	0	10	11	8
15	10	74	73	35	25	46	16	0	8	16	12	17
16	11	54	64	29	33	41	9	0	33	18	13	26
17	27	36	52	16	34	34	22	0	20	19	12	40
18	42	28	44	15	41	18	36	7	16	15	16	47
19	47	18	34	32	42	38	23	7	8	0	22	41
20	60	30	23	42	32	46	8	7	30	0	16	49
21	62	31	20	45	52	75	8	15	39	0	23	52
22	62	25	30	67	53	61	14	10	48	20	29	52
23	60	33	37	72	47	48	0	17	58	38	39	52
24	50	38	29	73	57	48	9	22	63	36	37	52
25	39	48	27	67	64	47	14	28	82	53	38	60
26	27	37	23	67	46	43	8	38	82	59	54	68
27	8	36	32	67	51	38	9	37	83	53	56	26
28	14	36	43	60	32	39	10	47	80	66	54	14
29	7		46	54	23	51	17	56	75	70	54	0
30	16		50	42	21	33	11	64	71	63	55	0
31	13		56		17		22	82		37		0
MEAN	42.2	42.1	45.4	57.6	41.5	37.6	20.4	25.6	60.8	33.0	22.1	24.2

1972 yearly mean = 68.9

DAILY SOLAR FLUX AT 2800 MHz
OTTAWA ARO

FLUX ADJUSTED TO 1 A.U., S_a

1973

DAY	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1	93.9	88.6	99.5	115.0	111.9*	85.2	90.9	86.9	114.9	109.0	87.0	86.9
2	98.2	88.6	101.6*	118.1*	115.1*	83.1	93.1	86.8	129.2*	106.1	83.9	86.3
3	105.1*	93.1	97.8*	129.4	117.3	81.5	93.5	85.0	136.5	103.5	81.1	82.7
4	109.3*	94.1*	96.6	122.3	115.9*	81.0	94.9	86.2	135.0*	94.9	77.4	78.6
5	113.3	94.3	94.8	117.7	115.0*	82.5	97.9	85.1	135.1*	90.6*	73.9	73.6
6	115.0	95.3*	98.9	112.7*	109.7	85.1	99.4	88.8	130.9	85.9	73.2	70.9
7	112.3	98.5	92.2	110.3	103.4	85.3	99.9	90.8	121.7*	82.2	72.1	70.4
8	103.2	100.5	98.9*	121.0	100.0	87.4	97.6*	87.5	115.7	80.1	70.4	70.9
9	103.7	100.9	104.7*	120.5	95.1	88.9	98.6*	87.1	113.1*	79.1	70.4	71.2
10	103.8	102.1*	105.6*	115.5	90.9*	91.0	100.5	83.4	106.7*	77.0	70.7	72.3*
11	102.8	101.2	113.4	110.3*	87.0	92.9	94.0	78.9	96.8	74.9	71.2	71.9
12	103.5	104.6*	114.5	130.4*	86.8	93.6	85.4	76.3	89.5	72.0	70.7	72.5
13	100.9*	104.7*	118.9	99.4*	85.2	96.3	80.3	74.7	84.6	70.5	72.6	73.1
14	96.2	105.6	114.0*	92.7*	89.3	97.7*	79.5	74.1	82.9	72.7	73.8	73.8
15	94.6	104.7	107.1*	89.5	90.1	98.2	78.7	72.6	82.6	75.7	75.0	76.6
16	93.8	98.7	106.9	85.0	89.5	95.2	79.5	74.1	83.9	75.6	75.6	79.7
17	94.2	94.2	101.5	82.1	91.4	89.8	78.1	75.0	81.8	79.5	75.3	82.1
18	95.3	90.7	94.9	80.9	95.4	91.4	83.6	75.3	84.6	78.3	75.5	84.9
19	94.8	88.9	96.7*	82.8	99.4	99.2	81.6	75.4	86.6	76.7	75.4	87.8
20	98.3	89.4	91.0	86.4	104.7*	105.4	79.5	76.8	92.0	73.4	76.8	89.9
21	97.9	89.9	87.4	95.2	102.2	108.8	79.4	80.4*	94.9	80.0	80.7	97.6
22	98.5	89.7	90.3	105.0	103.1	109.4	77.6	80.4	99.5	85.0	84.7	96.7*
23	97.2	91.4	87.1	109.2	99.6	108.8	78.6	81.8	103.9	89.9	86.5	96.0
24	96.9	93.6*	89.4	109.0*	104.5	106.1	81.6	85.3	106.2	97.6*	87.0	98.1
25	95.6	97.2	90.0	109.2*	104.7	101.3	83.8	88.9	112.7	101.0	88.0*	97.6
26	95.3	95.6	88.6	110.1*	101.1	100.3	85.0	91.2	115.5	101.0	91.8*	92.9
27	93.4	98.2	92.0	111.6*	99.9	94.8	85.5	95.1	115.9	101.7*	88.8	88.6
28	91.7	100.9*	94.2	112.6	94.1	95.2	84.2	97.5	118.1	100.7	90.7	81.7*
29	91.4		99.0	109.5*	93.3	95.1	89.5*	100.8	116.5	99.1	94.9	76.4
30	89.7		102.8	106.2*	90.8	94.1*	86.1	101.3	116.5*	97.4*	95.7*	74.1
31	87.7		110.3		87.2		86.6	109.6		90.5		72.0
MEAN	99.0	96.3	99.4	105.8	99.1	94.2	87.2	84.9	106.8	87.1	79.7	81.5

* adjusted for burst

Note: Beginning with the August 1973 data the flux values given for 2800 MHz adjusted to 1 A.U. had contained a multiplier of .90 as recommended by Commission V of URSI. For the sake of consistency the above table does not contain this correction.

DAILY

D

DEC. 1973	YEAR DAY	BARTELS 27-DAY CYCLE NUMBER	SUNSPOT NUMBERS		OBSERVED FLUX	
			R_Z	$R_{A'}$	OTTAWA 2800	AFCRL 15400
1	335	11	46	35	89.4	529
2	336	12	20	24	88.8	522
3	337	13	24	16	85.2	527
4	338	14	0	0	80.9	521
5	339	15	0	0	75.8	522
6	340	16	0	0	73.0	517
7	341	17	0	7	72.6	516
8	342	18	7	9	73.1	516
9	343	19	8	9	73.4	513
10	344	20	16	9	74.5*	509
11	345	21	9	13	74.2	506
12	346	22	9	10	74.8	513
13	347	23	8	9	75.4	519
14	348	24	8	9	76.2	520
15	349	25	17	16	79.1	521
16	350	26	26	22	82.3	520
17	351	27	40	31	84.8	530
18	352	1	47	34	87.7	530
19	353	2	41	36	90.7	524
20	354	3	49	45	92.9	520
21	355	4	52	42	100.8	523
22	356	5	52	41	99.9*	517
23	357	6	52	54	99.3	523
24	358	7	52	44	101.4	536
25	359	8	60	53	100.9	526
26	360	9	68	48	96.1	529
27	361	10	26	16	91.6	529
28	362	11	14	3	84.5*	515
29	363	12	0	0	79.0	517
30	364	13	0	0	76.6	515
31	365	14	0	0	74.5	515
MEAN			24.2	20.5	84.2	521

* Corrected for burst.

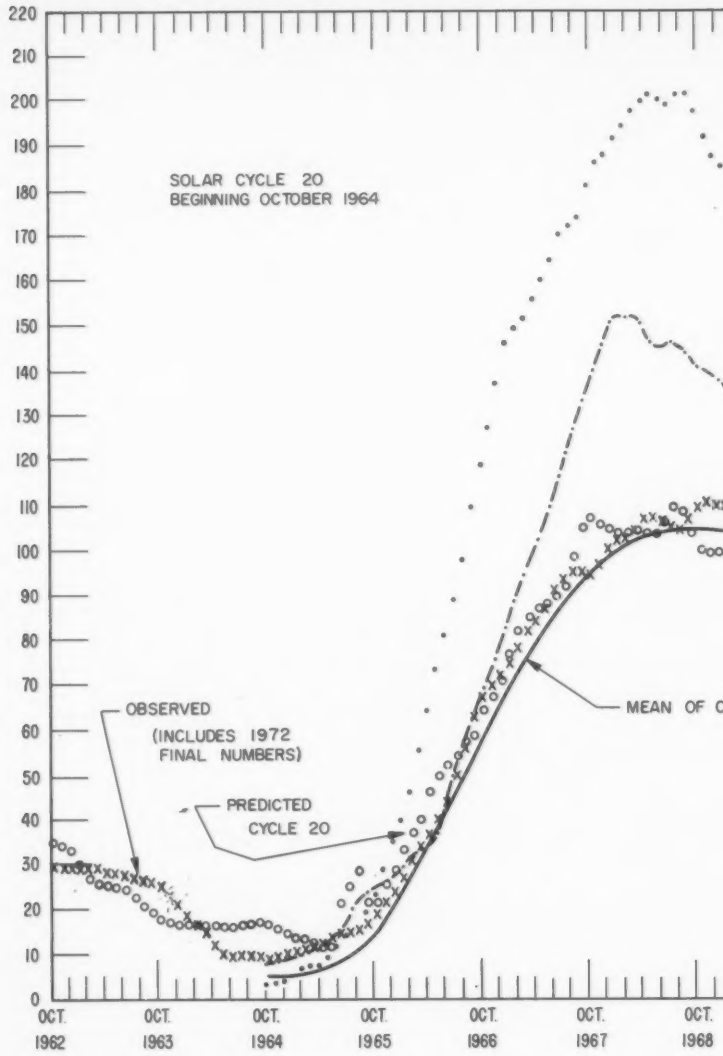
Errata: The flux values reported in 352, Part I, page 7 f
These should read 8.8 8.6 8.4 8.8 8.6 9.0 9.6 10.

Y SOLAR INDICES

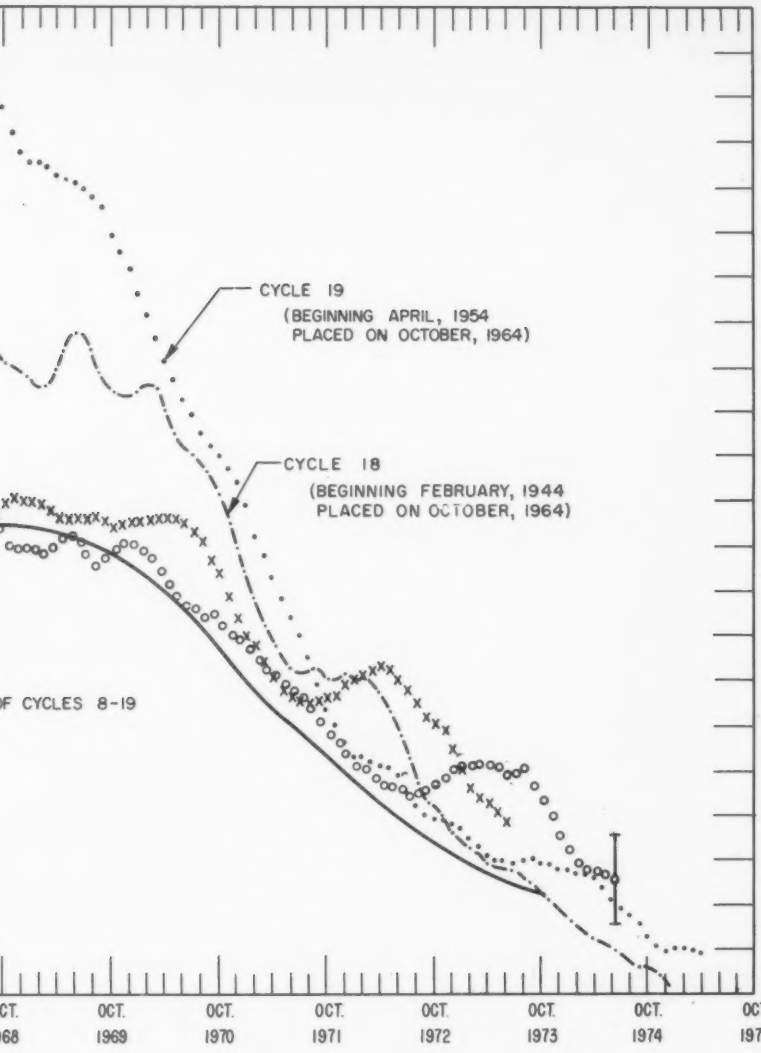
DECEMBER 1973

	SOLAR FLUX ADJUSTED TO 1 A.U.							
	AFCRL 8800	AFCRL 4995	OTTAWA 2800	AFCRL 2695	AFCRL 1415	AFCRL 606	AFCRL 410	AFCRL 245
	282	129	86.9	87.1	54.3	39.0	20.2	9.6
	288	135	86.3	86.2	54.7	37.7	23.0	9.3
	278	131	82.7	81.5	52.2	38.7	20.4	8.3
	272	121	78.6	78.8	52.7	38.1	19.9	8.7
	268	118	73.6	74.3	49.8	36.7	19.5	8.7
	268	116	70.9	70.7	47.9	36.9	18.3	8.2
	269	115	70.4	70.7	48.2	36.8	18.7	8.5
	270	115	70.9	71.2	48.3	37.2	18.7	8.6
	266	114	71.2	67.6	48.3	36.5	19.8	8.9
	264	113	72.3*	71.9	47.5	36.4	18.6	8.8
	269	118	71.9	71.3	49.9	37.6	19.9	8.5
	268	112	72.5	73.1	50.5	38.3	19.3	9.1
	268	116	73.1	73.0	49.7	37.6	18.8	9.2
	270	114	73.8	73.5	53.2	38.0	19.2	9.2
	270	118	76.6	77.1	53.1	40.3	20.8	10.2
	280	125	79.7	80.0	57.0	41.3	24.3	11.0
	284	126	82.1	82.0	56.6	41.3	20.1	11.9
	286	129	84.9	86.3	62.2	43.7	25.9	11.4
	281	130	87.8	85.6	62.0	44.4	27.1	11.4
	285	130	89.9	88.4	64.3	44.8	25.8	11.0
	292	139	97.6	94.4	71.1	47.3	21.5	10.9
	289	140	96.7*	98.2	69.7	47.5	27.9	11.6
	294	144	96.0	97.7	72.2	46.1	26.2	11.0
	293	143	98.1	98.9	70.6	46.9	28.2	17.8
	291	138	97.6	96.7	69.6	45.0	25.6	10.0
	282	129	92.9	89.8	65.0	41.2	19.7	8.2
	283	129	88.6	85.3	59.6	41.5	19.2	8.2
	275	129	81.7*	80.0	52.7	37.2	18.7	8.1
	270	124	76.4	75.1	51.9	37.2	16.3	7.7
	268	115	74.1	71.0	53.5	37.2	17.4	11.1
	267	115	72.0	70.6	52.9	35.7	22.9	8.0
	277	125	81.5	80.9	56.5	37.2	21.4	9.8

7 for 245 MHz at AFCRL were incorrect beginning with November 14.
10.0 10.7 13.7 15.9 -- 23.9 13.4 16.0 10.4 10.9 Mean 10.3.



PREDICTED AND OBSE



BSERVED SUNSPOT NUMBERS

SMOOTHED OBSERVED AND PREDICTED SUNSPOT NUMBERS
CYCLE 20

MONTH	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.
1964										9.6	10.2	11.0
1965	11.7	12.0	12.5	13.6	14.6	15.0	15.5	16.4	17.4	19.7	22.3	24.5
1966	27.7	31.3	34.5	37.4	40.7	44.6	50.3	56.6	63.1	67.6	70.2	72.7
1967	75.0	78.8	82.2	84.6	87.4	91.3	94.1	95.3	95.3	95.0	97.1	100.6
1968	102.6	102.9	104.7	107.2	107.6	106.6	105.2	104.8	107.0	109.9	110.6	110.1
1969	110.0	109.6	108.0	106.4	106.2	106.1	105.8	106.4	105.4	104.1	104.6	104.9
1970	105.6	106.0	106.2	106.1	105.8	105.3	103.8	101.0	97.2	93.9	89.4	84.1
1971	80.4	77.8	74.4	70.9	68.1	66.7	65.4	64.6	65.8	66.2	66.8	69.4
1972	70.8	71.2	72.4	73.4	72.9	70.5	68.1	65.4	62.0	60.3	58.5	54.8
1973	50.3	45.8	43.6	42.3	40.3	38.6	37.4 (2)	36.7 (3)	35.9 (5)	34.4 (6)	32.7 (6)	31.1 (6)
1974	29.8 (6)	28.5 (7)	27.5 (8)	26.8 (9)	26.4 (9)	25.5 (10)	24.3 (10)	22.8 (9)	21.2 (9)	19.8 (10)	18.5 (10)	17.5 (10)
1975	16.7 (10)	15.7 (10)	15.0 (10)	14.5 (9)	13.9 (9)	13.5 (10)	13.3 (11)					

For each month, the upper figure is the observed or predicted Zürich smoothed sunspot number. The lower figure in parenthesis is the corresponding absolute value of the 90% prediction interval, an indication of the uncertainty above and below the predicted number. Observed numbers are those with no prediction intervals. The observed smoothed sunspot numbers are based on final Zürich numbers through 1972.

The predicted sunspot numbers are derived from a regression analysis based on cycles 8 through 19. Tests indicate that earlier cycles are from a different statistical population. From July 1968 - February 1970 a regression analysis based on cycles 1 through 19 was used because it had not then been proven that two populations exist.

SOLAR FLARES

PARTIAL LISTING

Solar Flares for which at least one observatory has assigned a numerical importance of "1" or greater.

DECEMBER 1973

OBSERVATORY	OBSERVED UT DATE DEC	START	END	MAX. PHASE	LOCATION APPROX. LAT.	MER. DIST.	CENTRAL DISTANCE	MCMATH PLAGE REGION	CMP DAY	DURATION MIN.	IMPORTANCE	OBS. COND.	OBS. TYPE	MEASUREMENTS TIME UT	MEAS. AREA Mi. Deg.	CORR. AREA Sq. Deg.	MAX. WIDTH Hα	MAX. INT. %	REMARKS
MANI	02	0151	0243	0203	S15	W55	.835	12628	28.0	52	1N	2		0203	2.06	3.56			F
CRON	02	0200	0222	0208	S14	W58	.860		27.7	22	SN				1.03				
CATA	02	0850E	09200	0920	S14	W61	.884	12628	27.8	300	1B			0920	2.02	4.33		(263)	
BUCA	02	0858	1000		S13	W61	.883		27.8	62	SN		C	0902	.55	1.10			D
CANR	02	0908	0914D	0912	S13	W60	.875		27.9	6D	SN			0912	.62	1.20			
RAMY	02	1459	1519	1508	S13	W64	.903		27.8	20	SF	3	C		.37				F
MCMA	02	1500E	1538	1516	S14	W66	.920	12628	27.7	38D	1N		C	1516	1.29	3.00			E
RAMY	02	1508	1529	1519	S14	W65	.914		27.8	21	1N	3	C		1.49				F
CANR	04	1142	1222	1206	S13	W90	1.000	12628	27.7	40	1B			1206	.83	3.20			
PALE	14	2135	2147	2140	N05	E90	1.000		21.6	12	1N	3	C						
CRON	16	0528E	0617		S18	E87	.998	12664	22.8	49D	1F				.52				
CRON	16	0736E	0858	0752	S18	E87	.998	12664	22.8	82D	1N				.52				
TEHR	16	0920E	1023	0925	S18	E85	.996		22.8	63D	SN	3	V		.50				DE
TEHR	16			0946							SB				.41				DE
CRON	16	0938E	1006	0948	S18	E85	.996	12664	22.8	28D	1N								
ATHN	16	0942E	0953D	0942U	S18	E84	.994		22.7	11D	SN	2	C						DE
BUCA	19	0755	0832		S17	E41	.685	12664	22.4	37	1N		C	0807	2.21	3.00			E
CRON	19	0756	0823	0801	S18	E44	.722		22.6	27	SN								
TEHR	19	0756E	0816	0759	S17	E41	.685		22.4	20D	SN	4	V		1.49				F
MEUD	19	1039	1105		S17	E43	.708	12664	22.7	26	1N		C	1148	1.75	2.40			F
CRON	19	1040	1050D	1044	S18	E48	.765	12664	23.0	10D	1N								
CANR	19	1040	1110	1045	S17	E46	.741	12664	22.9	30	1N			1045	2.06	2.60			
UPIC	19	1041	1051D	1044U	S16	E46	.739	12664	22.9	10D	1B		P	1044	2.10				
WENO	19	1042E	1108		S18	E46	.744	12664	22.9	26D	2N		P		8.25				
RAMY	19	1111E	1119		S18	E42	.700		22.6	8D	SF	3	C						DE
CRON	21	0416E	0448	0423	S18	E16	.386	12664	22.4	32D	1N				2.27				
RAMY	25	2013	2039D	2016	S16	W48	.757	12664	22.2	26D	1F	3	C		1.86				F
PALE	25	2013	2037D	2018	S15	W50	.777		22.1	24D	1N	3	C		1.68				U F
CRON	26	0722E	0735	0722E	S15	W74	.961	12668	20.8	13D	1F			0722	1.86				
TEHR	26	0730E	0745	0730U	S12	W74	.961		20.8	15D	SF	4	V		.93				F

"Remarks":
A = Eruptive prominence, base at >90°
B = Probably the end of a more important flare.
C = Invisible 10 minutes before.
D = Brilliant point.
E = Two or more brilliant points.
F = Several eruptive centers.
G = No spots visible in the neighborhood.
H = Flare with high velocity dark surge.
I = Very extensive active region.
J = Plage with flare shows marked intensity variations.
K = Several intensity maxima.
L = Filaments show effects of sudden activation.
M = White-light flare.
N = Continuous spectrum shows effects of polarization.
O = Observations have been made in the calcium II lines H or K.
P = Flare shows helium D_3 in emission.
Q = Flare shows the Balmer continuum in emission.
R = Marked asymmetry in Hα line.
S = Brightening follows disappearance of filament (same position).
T = Region active all day.
U = Close and somewhat parallel bright filaments (|| or Y shape).
V = Occurrence of an explosive phase.
W = Great increase in area after time of maximum intensity.
X = Unusually wide Hα emission.
Y = Onset of a system of loop-type prominences.
Z = Major sunspot umbra covered by flare.

Note: Catania and Capri-S express Maximum Intensities in percent of the local undisturbed chromosphere instead of percent of the local continuum. Parentheses are used to indicate this difference.

SOLAR FLARES

Date, time (UT) and coordinates of Subflares not included in preceding table.

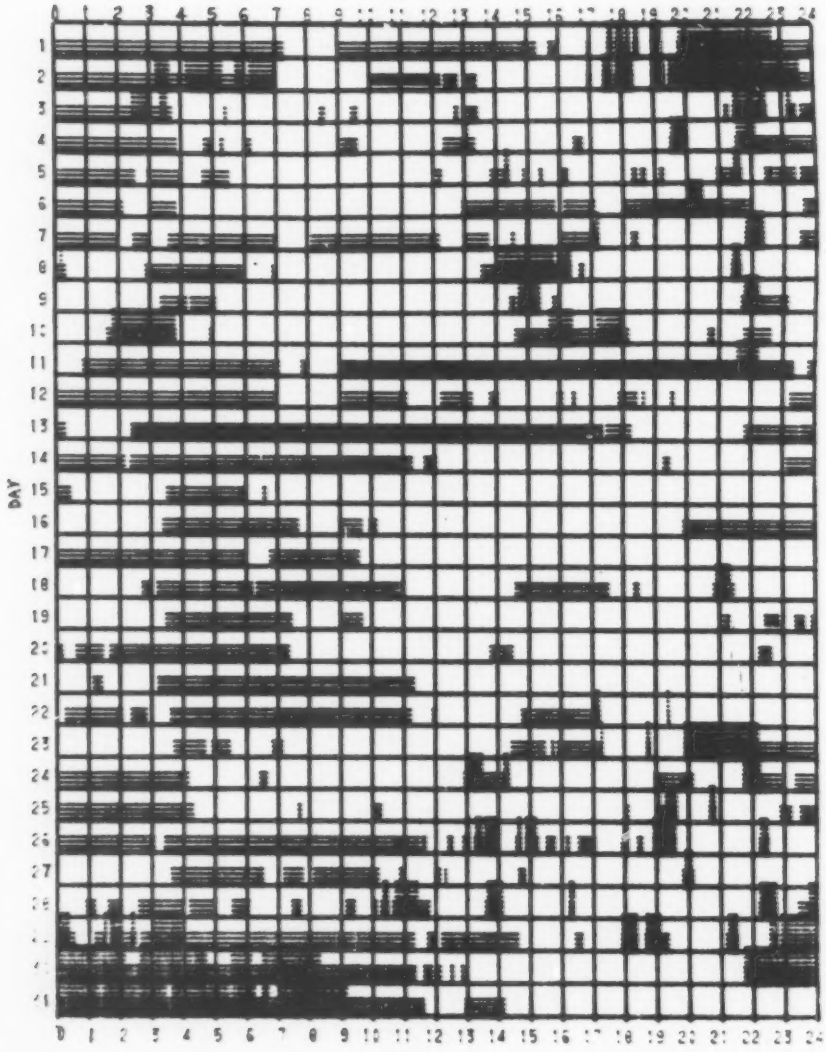
DECEMBER 1973

01 0742E	S09 W48	01 0743	S09 W48	01 0743E	S12 W48	01 1113E	S14 W50	01 1136	S10 W51	01 1138	S09 W50
01 1229	S14 W48	02 0356	S16 W58	02 1221	S12 W67	02 1223E	S13 W60	02 1340E	S15 W64	02 1608	S13 W65
02 1826	S13 W67	02 1850E	S13 W66	02 2010E	S14 W67	03 0118E	S12 W70	03 0204	S14 W69	03 0338E	S13 W67
03 0340E	S14 W70	03 0341E	S13 W67	03 0621	S13 W67	03 1753E	S13 W85	04 1055E	S13 W90	04 1537	S13 W90
05 0721	N08 E52	05 0722	N07 E53	05 0727E	N06 E51	08 0719E	N08 E19	09 1523E	N06 E59	10 0803	N02 E80
11 0803	N03 E80	12 0850	N04 E22	12 0851E	N07 E22	14 2019E	N05 W12	15 1130	S12 E80	15 1511	N01 W28
15 1829E	N00 W31	15 2013	N02 E77	16 0747	S17 E88	16 0750	N07 E72	16 0750	S18 E85	16 0933	S14 E73
16 0936	S14 E75	16 1035	S17 E82	16 1056E	S18 E85	16 1110E	S17 E82	16 1203	S13 E64	16 1316	S17 E80
16 1954	S17 E74	16 1954	S17 E74	16 2145	S19 E75	16 2355	S18 E75	16 2355	S18 E75	17 0029	S19 E75
17 0043E	S19 E77	17 0257	S15 E57	17 0315	S19 E76	17 0325E	S18 E72	17 0742	S19 E74	17 0747E	S18 E70
17 0907E	S18 E68	17 1030	S14 E67	17 1052E	S12 E65	17 1148E	S18 E66	17 1303	S16 E67	17 1303	S18 E67
17 1335	S18 E66	17 1335	S16 E66	17 1446	S16 E65	17 1448E	S18 E66	17 1452	S16 E66	17 1523	S18 E66
17 1623	S15 E65	17 1624E	S16 E66	17 1625	S18 E65	17 1706	S18 E65	17 1802E	S18 E65	17 2355	S18 E75
17 2355	S18 E75	18 1238	S10 E87	18 1530	S14 E52	18 1659E	S17 E49	18 1745	S17 E48	18 1801	S17 E48
18 1941	S15 E48	18 1945	S11 W40	18 2331E	S16 E45	19 0124	S15 E46	19 0124E	S18 E45	19 1026	S17 E42
19 1242	S18 E41	19 1934	S18 E37	19 2129	S17 E35	20 0714E	S19 E24	20 0908E	S18 E24	20 0954E	S18 E24
20 1321	S17 E26	20 1906	N10 E24	20 1947E	S19 E18	20 1947E	S19 E18	20 2148	S18 E25	20 2149E	S18 E26
20 2155	S15 E19	20 2155	S14 E19	20 2248	S18 E15	20 2249E	S18 E15	20 2349E	S15 E21	21 0145	S18 E18
21 1255	S15 E09	21 1938E	S18 E08	21 2003	S18 E05	21 2003	S18 E05	21 2215E	S18 E01	21 2248E	S18 E03
21 2248E	S18 E03	21 2303E	S18 E03	22 0022E	S18 E03	22 0112E	S18 E03	22 0229E	S18 E02	22 0252E	S18 E02
22 0302E	S18 E02	22 2252E	S18 E02	23 0104E	S18 W11	23 0558E	S16 W31	23 0559	S14 W32	23 0752	S14 W35
23 0752	S16 W32	23 0800E	S18 W35	23 1129E	S17 W37	23 1416	S16 W40	23 2332E	S16 W44	23 2333E	S15 W43
24 0053	S12 W39	24 1518	S16 W53	24 1823	S15 W36	24 2110	S16 W40	25 1534	S15 W66	25 2104	S17 W50
25 2112E	S17 W44	25 2112E	S16 W51	26 1125E	S16 W54	26 1233E	N07 W64	26 1236	N08 W51	26 1350	S14 W90
26 1355E	S13 W80	26 1725	N07 W67	26 2331	S17 W62	26 2337E	S16 W64	26 2339E	S18 W62	27 0432E	N07 W73
27 1046	S14 W79	27 1610	S18 W78	27 2011	S13 W78	27 2241	S14 W83	27 2241	S14 W83	27 2252	S15 W83
30 1219E	N23 W71										

INTERVALS OF NO FLARE PATROL OBSERVATION

FOR PRECEDING SOLAR FLARE TABLE

DECEMBER 1973



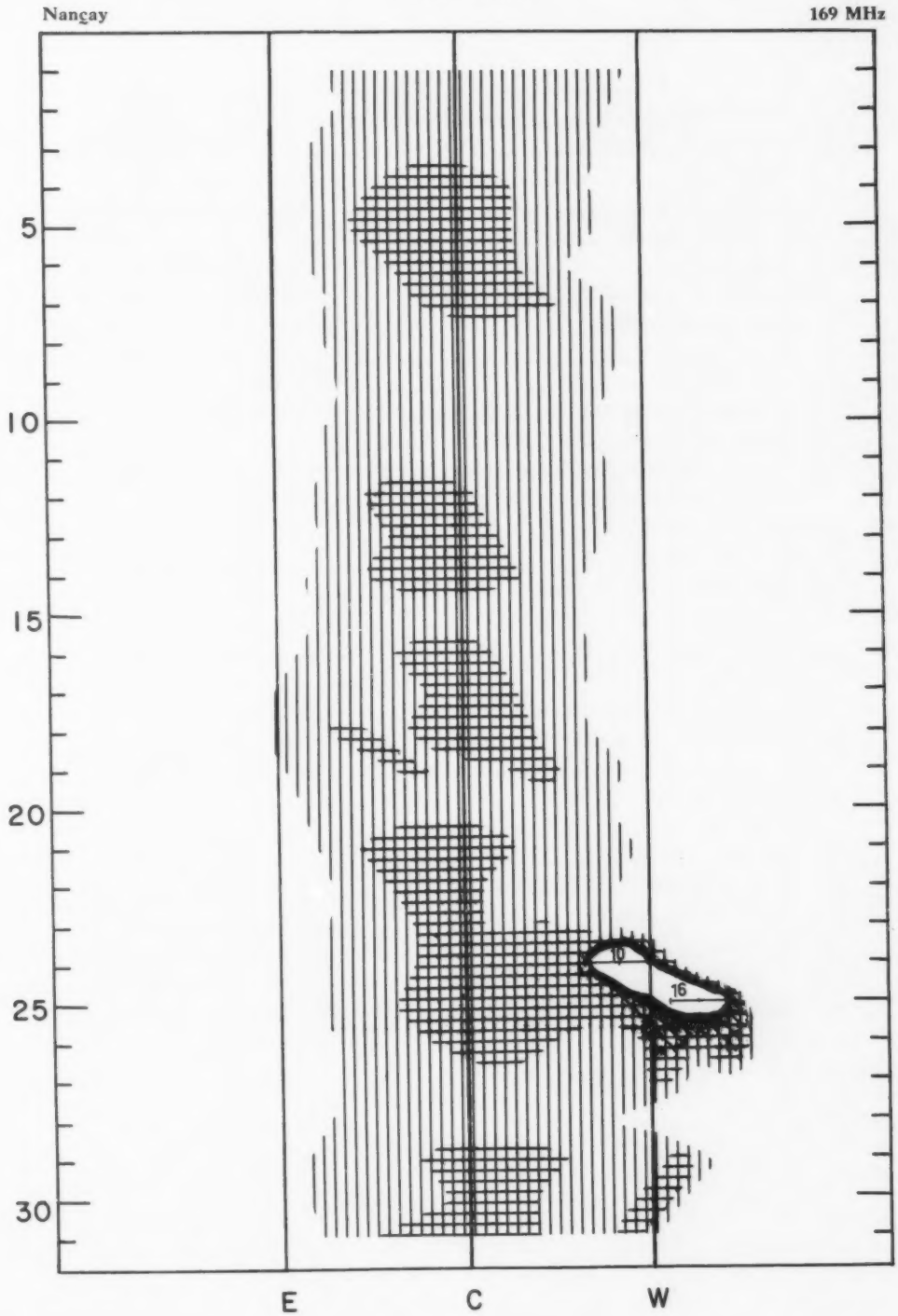
Observatories included in total patrol:

Athenes	Catania	Manila	Palehua	Upice
Bucharest	Gran Canaria	McMath-Hulbert	Ramey	Wendelstein
Carnarvon	Herstmonceux	Meudon	Teheran	

Times of no flare patrol are shown by the shaded area for each day divided into times of no cinematographic patrol (bottom half of day) and times of neither visual nor cinematographic patrol (top half of day).

SOLAR RADIO EMISSION
INTERFEROMETRIC OBSERVATION

DECEMBER 1973



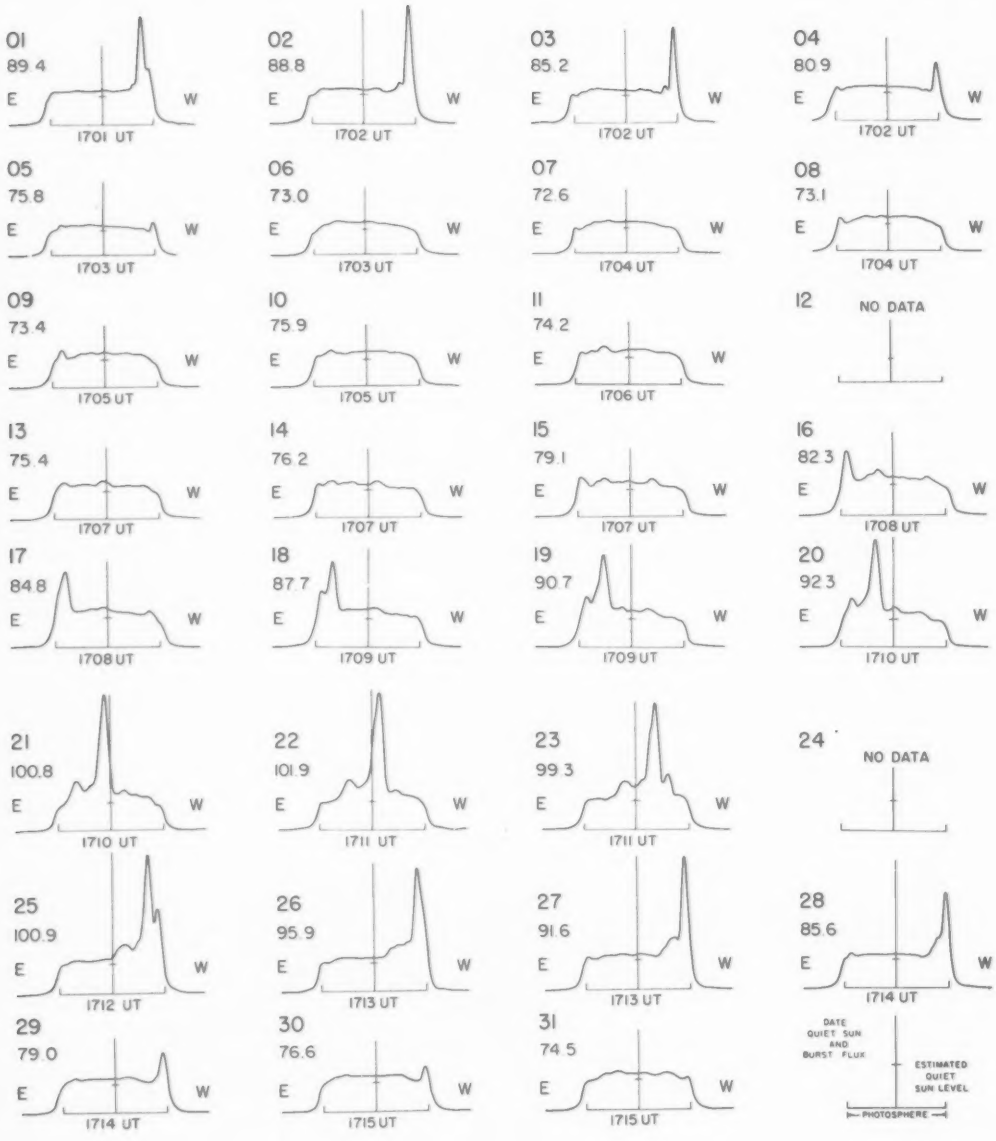
14
Dec 73

EAST-WEST SOLAR SCANS

December 1973

ALGONQUIN RADIO OBSERVATORY
CANADA

10.7cm
Fan-Beam with 1.5 minutes of arc
E - W Resolution

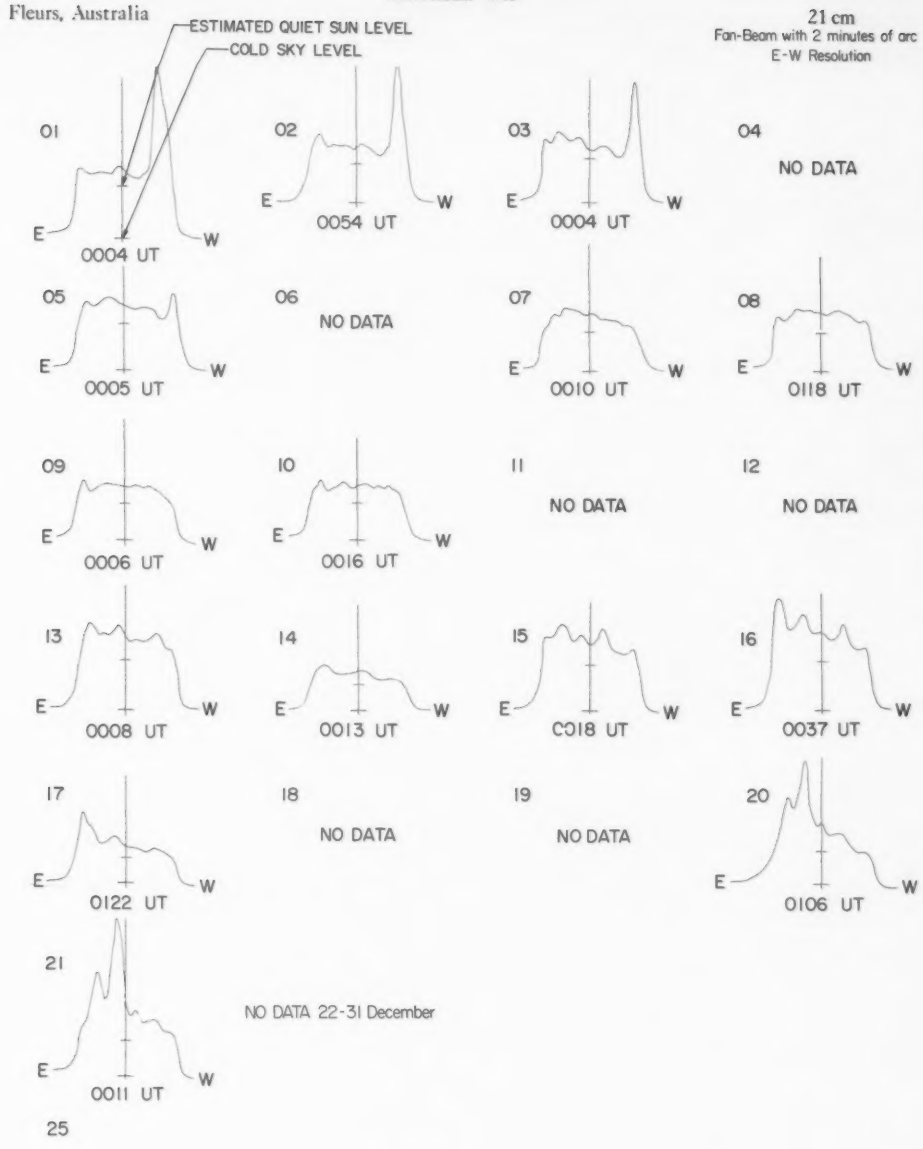


EAST-WEST SOLAR SCANS

DECEMBER 1973

Fleurs, Australia

21 cm
Fan-Beam with 2 minutes of arc
E-W Resolution



25

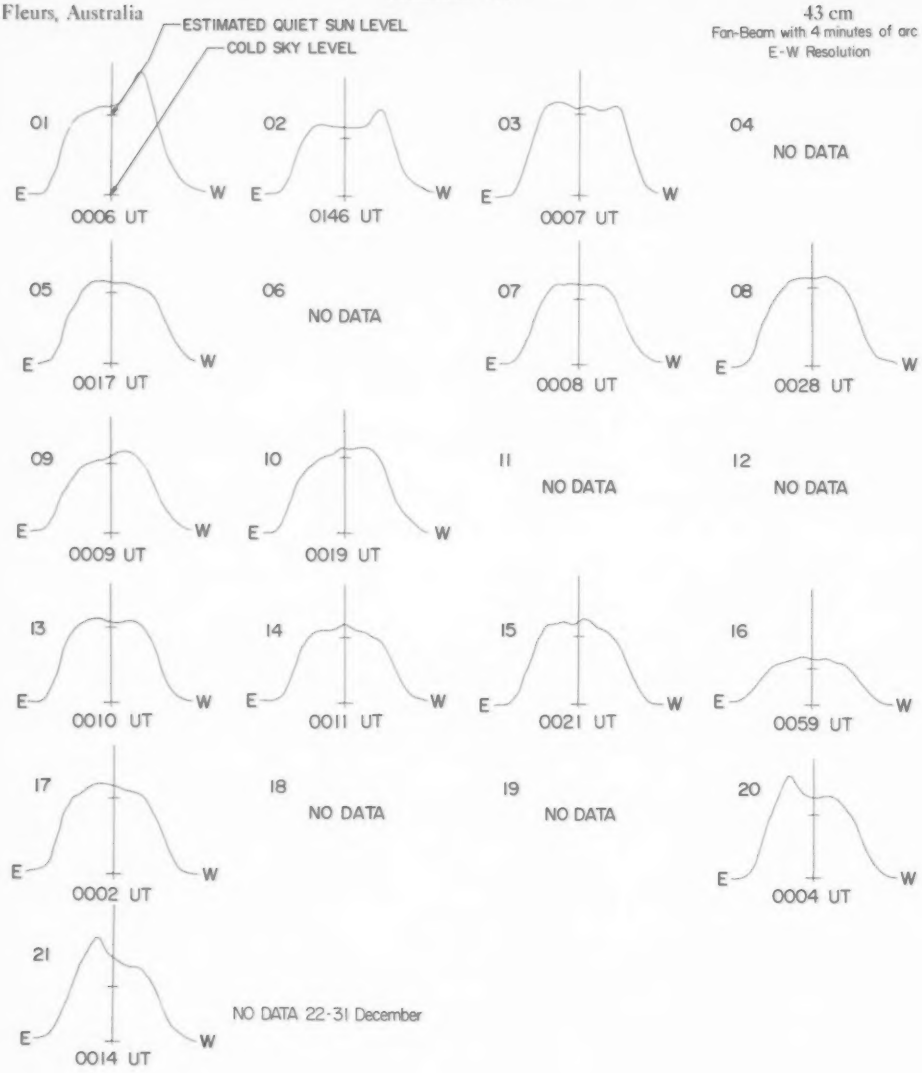
16
Dec 73

EAST-WEST SOLAR SCANS

DECEMBER 1973

Fleurs, Australia

43 cm
Fan-Beam with 4 minutes of arc
E-W Resolution



NO DATA 22-31 December

25

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

DECEMBER 1973

DEC. 1973	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1}		INT	REMARKS
				UT	UT	MINUTES	PEAK	MEAN		
1	2800	OTTA	26	1508	1508	5	1.4	0.7		
	2800	OTTA	20	1600	1615	30	1.0	0.5		
	2800	OTTA	20	1655	1813	180	2.8	1.4		
2	2800	OTTA	27	1457		90				
	2800	OTTA	24	1457	1500	3	.8	0.7		
	2800	OTTA	24	1500		80	.8	0.4		
	2800	OTTA	26	1620	1620	7	.8	0.4		
	2800	OTTA	1	1718	1719.5	7	1.2	0.6		
	2800	OTTA	20	1800	1840	100	2.8	1.5		
	2800	OTTA	23	1953	2015	80	2.8	1.4		
	2695	PENT	45	2006.5	2007	5	10.8	2.7		
	8800	SGMR	2	2006.4	2006.9	3.2	7.0	2.1		
	2695	SGMR	4	2006.3	2006.9	3.6	10.1	3.0		
	2695	BOUL	45	2007	2007.5	4	12.0	4.0		
3	2800	OTTA	27	1415		230	1.4	1.1		
	2800	OTTA	24	1415	1500	45	1.4	0.7		
	2800	OTTA	24	1500		140	1.4			
	2800	OTTA	26	1720	1720	45	1.4	0.7		
4	2695	MANI	1	0540.2	0540.6	1.8	4.3	1.7		
	2695	CANR	3	0851.5	0852.5	1.5	3.0	1.0		
	2695	CANR	8	1145.5	1146	1	6.0	2.0		
	2695	CANR	3	1204.5	1207	3.5	5.0	2.0		
	2800	OTTA	2	1519.2	1519.9	1.8	2.8	1.3		
	2695	BOUL	8	1519.5	1520	1.5	6.0	2.0		
	2695	CANR	3	1725.5	1726.5	1.5	3.0	1.0		
	2800	OTTA	46	1948.5	1950	3	7.2	3.6		
	2695	BOUL	45	1949	1950.5	3	10.0	4.0		
5	2695	CRON	3	0009.5	0011	3	7.0	3.0		
	2695	CANR	45	0936.5	0938	3	3.0	1.0		
	2695	CANR	45	0936.5	0939	3	3.0	1.0		
9	2800	OTTA	22	1502	1515	100	1.2	0.6		
	2695	CANR	45	1722.5	1724.5	2	14.0	4.0		
10	2800	OTTA	20	1557	1602	10	1.2	0.6		
	2800	OTTA	24	1613	1620	7	1.2	0.6		
	2800	OTTA	24	1620		340 D	1.2			
	2800	OTTA	22	1625		190	1.6	1.0		
	2695	CANR	45	1734	1736	2	7.0	2.0		
14	2695	CANR	3	0946.5	0948	2.5	3.0	1.0		
15	2695	CANR	8	1742.5	1743.5	1	19.0	6.0		
16	2695	CRON	3	0752.5	0754	5	8.0	2.0		
	8800	MANI	1	0754.1	0754.6	3.3	4.1	1.4		
	2695	MANI	1	0754.1	0754.6	2.3	5.5	1.6		
	2695	CANR	40	1108.5	1116	14	10.0	2.0		
	2800	OTTA	24	1955	2008	13	1.4	0.7		
	2800	OTTA	24	2008		120 D	1.4			
	2695	PENT	1	2145	2146	4	4.0	1.4		
	2695	BOUL	3	2145.5	2146	2.5	6.0	2.0		
17	2695	CANR	3	1140.5	1141	2	7.0	2.0		
	2800	OTTA	20	1450	1535	105	1.4	0.7		
18	2800	OTTA	24	1438	1503	25	2.0	1.1		
	2800	OTTA	24	1503		440 D	2.0			
19	2800	OTTA	32	1512	1524	50	-1.4	-0.7		
	2800	OTTA	20	1655 E	1702	80 D	1.4			
20	2695	BOUL	8	1936	1937	1	95.0	25.0		
	2695	PENT	1	2107	2108	3	1.0	0.5		
	2695	BOUL	3	2249.5	2250.5	6	7.0	2.0		
	2695	BOUL	3	2257	2258	2	5.0	2.0		
21	2695	CRON	3	0144	0146	4.5	4.0	1.0		
	8800	MANI	20	0413.5	0416.4	17.7	15.9	6.4		
	2695	CRON	3	0414	0415.5	4.5	8.0	2.0		
	2695	MANI	1	0416.3	0416.5	1.9	8.6	3.4		
	2800	OTTA	20	1547	1555	90	1.6	0.8		
	2695	CANR	3	1648.5	1651	3.5	3.0	1.0		
	2695	CANR	3	1714.5	1715.5	2.5	8.0	3.0		
	2800	OTTA	32	1743	1815	48	-1.3	-0.7		
	2800	OTTA	24	1945	2000	15	1.6	0.8		
	2800	OTTA	24	2000		200 D	1.6			
	2800	OTTA	1	2022	2022.2	1.2	2.0	1.0		
	2695	PENT	20	2050	2108	60	1.5	0.8		
22	2800	OTTA	20	1535	1642	220	2.6	1.3		
	2695	BOUL	1	1716.5	1717	2.5	3.0	1.0		
23	2695	CRON	3	0100	0103	9.5	4.0	1.0		
	2695	CRON	3	0749.5	0752	9	4.0	1.0		
	2800	OTTA	22	1420	1438	28	1.4	0.9		

SOLAR RADIO EMISSION
SELECTED FIXED FREQUENCY EVENTS

DECEMBER 1973

DEC. 1973	FREQUENCY	STATION	TYPE	STARTING TIME	TIME OF MAXIMUM	DURATION	FLUX DENSITY 10^{-22} Wm^{-2} Hz^{-1}		INT	REMARKS
				UT	UT	MINUTES	PEAK	MEAN		
	2800	OTTA	20	1451	1500	20	2.0	1.5		
	2800	OTTA	24	1515	1525	10	1.0	0.5		
	2800	OTTA	24	1525		35	1.0			
	2800	OTTA	24	1600	1613	13	1.0	0.5		
	2800	OTTA	24	1613		56	1.0			
	2800	OTTA	24	1709	1717	8	1.4	0.7		
	2800	OTTA	24	1717		280 D	1.4			
	2695	MANI	8	2333.4	2333.5	.6	15.5	4.6		
24	2800	OTTA	24	1417 E	1525	68 D	7.4	3.8		
	2800	OTTA	24	1525		395 D	7.4			
25	2695	CRON	3	0222.5	0224	3	4.0	1.0		
	2695	CRON	3	0732.5	0734	4.5	4.0	2.0		
	2695	CANR	3	0820.5	0821.5	1.5	5.0	1.0		
	2800	OTTA	27	1520		210	2.4	2.0		
	2800	OTTA	24	1520	1538	18	2.4	1.2		
	2695	BOUL	3	1533.5	1535	2.5	4.0	1.0		
	8800	SGMR	2	1533.3	1534.5	2.4	2.9	1.2		
	2800	OTTA	1	1534	1534.8	1	2.2	1.4		
	2695	CANR	3	1534.5	1535.5	1.5	5.0	2.0		
	2695	SGMR	2	1534.3	1534.7	2.7	2.9	1.2		
	2800	OTTA	24	1538		154	2.4			
	2800	OTTA	26	1812	1812	38	2.4	1.0		
	2800	OTTA	21	2012	2017	50	1.4	0.7		
	2800	OTTA	2	2015	2015.2	1	1.6	0.8		
	2695	PENT	20	2110	2123	21	1.4	0.8		
27	2695	BOUL	3	2015.5	2017	4	7.0	2.0		
	2800	OTTA	1	2016	2016.8	4	2.8	1.4		
	2695	BOUL	45	2256	2258	2.5	19.0	5.0		
28	2695	CANR	3	1625	1626.5	2	5.0	1.0		
	2800	OTTA	20	1635	1700	60	1.4	0.7		
30	2695	CANR	45	0844	0845	4	4.0	1.0		
	2695	CANR	45	0844	0846.5	4	4.0	1.0		
	8800	SGMR	8	1735.4	1735.5	.2	32.4	6.5		
31	2695	CANR	3	1745	1746.5	2.5	3.0	1.0		

Observatories:

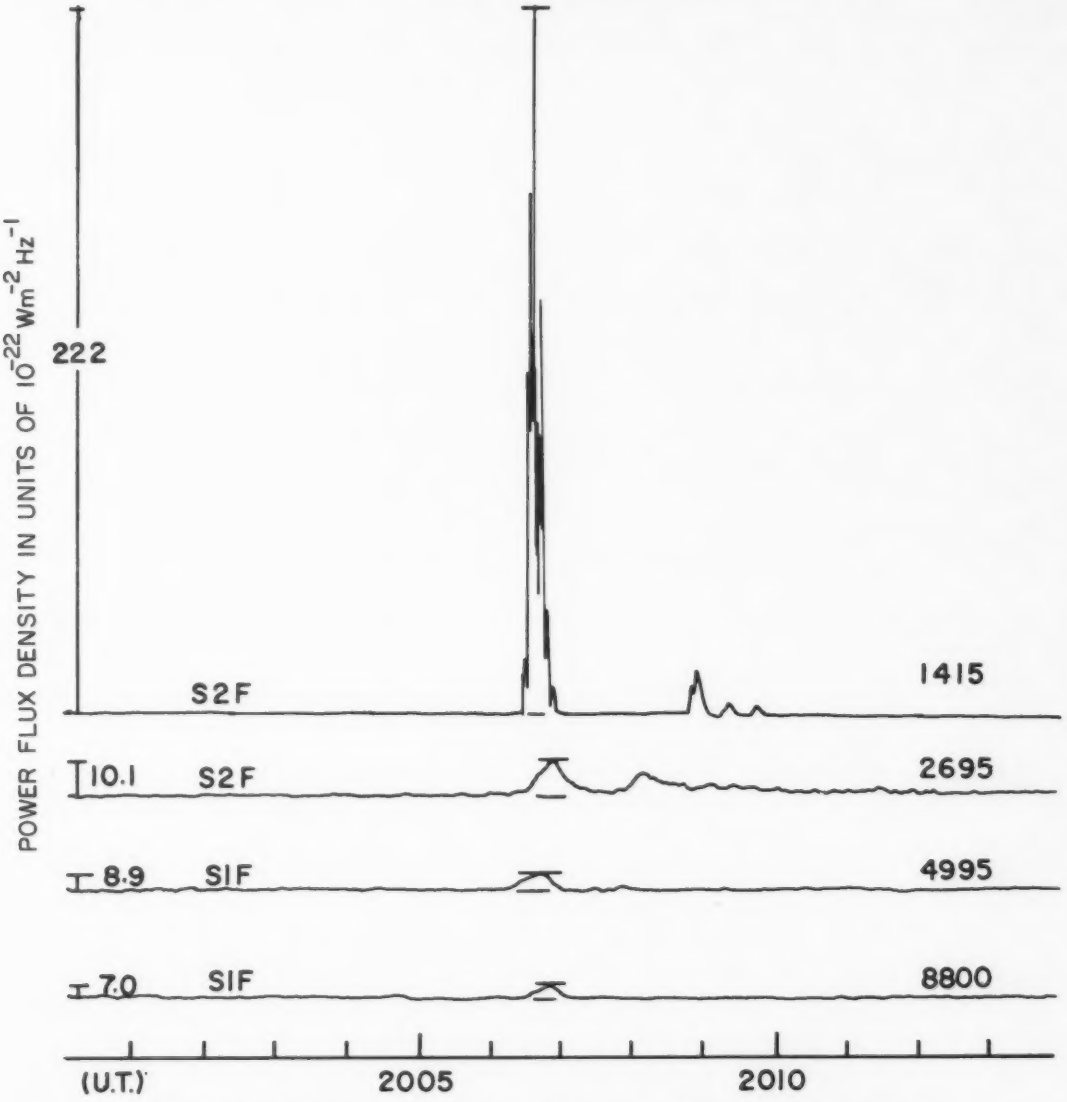
BOUL = Boulder
CANR = Canary Islands
CRON = Carnarvon
OTTA = Ottawa ARO
MANI = Manila
PENT = Penticton
SGMR = Sagamore Hill

Explanation of Type Code:

1 Simple 1
2 Simple 1F
3 Simple 2
4 Simple 2F
5 Simple
6 Minor
7 Minor +
8 Spike
20 Simple 3
21 Simple 3A
22 Simple 3F
23 Simple 3AF
24 Rise
25 Rise A
26 Fall
27 Rise and Fall
28 Precursor
29 Post Burst Increase
30 Post Burst Increase A
31 Post Burst Decrease
32 Absorption
40 Fluctuation
41 Group of Bursts
42 Series of Bursts
43 Onset of Noise Storm
44 Noise storm in Progress
45 Complex
46 Complex F
47 Great Burst
48 Major
49 Major +

SELECTED SOLAR NOISE BURST

2 DECEMBER 1973



RADIO BURST OBSERVED ON 2 DECEMBER, 1973 AT SAGAMORE HILL RADIO OBSERVATORY HAMILTON, MASSACHUSETTS

PIONEER VI

DECEMBER 1973

Date Dec. 1973	DSN Coverage (UT)	Data Time (UT)	ESP (°)	SOLAR WIND AMES[1] U_{H^+} (km/sec)	SOLAR WIND AMES[1] TAU (days)	SOLAR WIND MIT[2] U_{H^+} (km/sec)	SOLAR WIND MIT[2] N_{H^+} (H^+/cc)	COSMIC RAY PROTONS[3] (particles/sec) 6-13 (Mev*)	13-175 (Mev**)	>175 (Mev)
21	0732-1028	0900	-133.3	383	-9.3	377	9.9	.88	.121	1.11
22	0659-1024	0900	-133.7	339	-9.24	339	26.7	.59	.142	1.06
23	2033-2249	2200	-134.	383	-9.35	389	12.9	.4	.137	1.08
24	1922-2149	2100	-134.3	339	-9.28	343	28.	.41	.155	1.08
25	1943-2249	2100	-134.7	339	-9.3	347	45.9	.37	.148	1.14
26	1911-2218	2100	-135.	536	-9.59	525	11.5	.37	.142	1.13
27	1924-2250	2100	-135.4	448	-9.54	466	11.9	.35	.125	1.09
28	1835-2126	2000	-135.7	383	-9.46	379	13.4	.37	.134	1.14

[1] Wolfe - NASA/ARC
[2] Lazarus - MIT
[3] Simpson - University of Chicago

* Includes He 0.6-13 Mev/nucleons and electrons ∿0.5 Mev - see J. Retzler and J. A. Simpson, J. Geophys. Res., 74, 9, 2149-2160, 1969 for discussion of the electron response of Pioneer VII.

** Includes He >13 Mev/nucleons.
Q used to indicate that a rate is at its quiescent level.

Note: The notes published with the March 1972 data continue to apply to the current data.

ESP = Earth-Sun Probe Angle.

PIONEER VIII

DECEMBER 1973

Date Dec. 1973	DSN Coverage (UT)	Data Time (UT)	ESP (°)	SOLAR WIND[1]				IP E-FIELD[2]	IP MAGNETIC FIELD[3]			COSMIC RAY PROTONS[4] (particles/sec)	
				U_{H^+} (km/sec)	N_{H^+} (H^+/cc)	T_{H^+} (x10^{6}°K)	TAU (days)	400 Hz (mv)	|B| (λ)	φ (°)	Condition	>13.9 Mev	>64 Mev
28	2202-2400	2200	131.5	350	---	0.041	9.53	0.554	5.	290	quiet	7.75	1.41
29	2141-2328	2200	131.6	314	---	.03	9.5	.578	3.	321	quiet	7.93	1.37
30	2157-2324	2200	131.7	361	---	.035	9.55	.432	3.6	331	quiet	8.	1.37
31	0959-1300	1100	131.8	316	---	---	9.26	.416	4.1	---	quiet	7.99	1.43

[1] Wolfe - NASA/ARC
[2] Scarfe - TRW, Inc.
[3] Ness - NASA/Goddard & Mariani - Univ. of Roma
[4] Webber - Univ. of N.H.

ESP = Earth-Sun Probe Angle.

PIONEER IX

DECEMBER 1973

Date Dec. 1973	DSN Coverage (UT)	Data Time (UT)	ESP (°)	SOLAR WIND[1]				IP E-FIELD[2]	IP MAGNETIC FIELD[3]			COSMIC RAY PROTONS[4] (particles/sec)	
				U_{H^+} (km/sec)	N_{H^+} (H^+/cc)	T_{H^+} (x10^{6}°K)	TAU (days)	400 Hz (mv)	|B| (λ)	φ (°)	Condition	>13.9 Mev	>40 Mev
12	0018-0515	0100	-040.1	530	---	0.156	-2.72	0.26	3.7	321	quiet	6.69	1.22
		0500		503	---	.173		.251	3.3	266	disturbed	6.45	1.14
19	0349-0517	0400	-041.2	295	---	---	-2.47	.223	4.	338	disturbed	6.65	1.34

[1] Wolfe - NASA/ARC
[2] Scarf - TRW, Inc.
[3] Sonett and Colburn - NASA/ARC
[4] Webber - Univ. of N.H.

ESP = Earth-Sun Probe Angle.

INFERRED IP MAGNETIC FIELD

BARTELS ROTATION	DATE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1893	1971 DEC 20	T	A	A	A	A	A	A	A	T	T	T	T	–	T	T	T	T	T	T	T	T	T	T	–	T	T	T
1894	1972 JAN 16	T	A	A	A	A	T	T*	T	T	T	T	T	T	T	T	T	T	A	A	A	T	T	T	T	T	TA	A
1895	FEB 12	A	T	A	A	A	A	T	T	T	TA	A	–	A	T	T	T	T	TA	A	T	T	T	T	T	TA	A	A
1896	MAR 10	A	A	A	A	A	A	A	A	A	A	A	T	A	T	T	T	T	A	A	T	T	T	T	T	T	A	A
1897	APR 6	A	T	T	A	T	T	T	T	T	T	T	T	T	A	T	T	A	A	A	A	A	–	A	A	T	TA	A
1898	MAY 3	A	A	A	–	A	T	T	T	T	T	T	T	T	A	A	T	A	A	A	A	A	T	A	T	T	A	T
1899	MAY 30	A	A	*	A	A*	T	T	A	T	T	T	A	–	–	–	–	–	T	–	A	A	T	T	T	T	TA	A
1900	JUN 26	A	A	A	A	A	A	A	AT	T	T	T	TA	A	T	T	A	A	A*	A*	A	T*	T	T	T	T	T	TA
1901	JUL 23	A*	A*	A*	A	A	A	A	A*	T	T	A	A	A	–	A	T	T	T	T	T	A	T	T	T	T	A	–
1902	AUG 19	–	–	A	A	A	A	A	T	A	A	A	A	T	A	A	A	T	T	T	T	A	A	T	A	A	A	–
1903	SEP 15	A	T*	A	A	A	A	A	T	A	A	A	–	–	–	–	–	T	T	T	T	T	–	T	A	A	A	T
1904	OCT 12	T	–	–	A*	T	T	T	A	A	T	A	A	A	A	A	AT	T	AT	T*	T	–	A*	AT	T	T	*	A
1905	NOV 8	A	A	A	AT	AT	AT	T	T*	A	A	A*	AT	A	A	AT	T	T	TA	T	T	T	A	A	A	A	AT	T
1906	DEC 5	T	T	AT	–	–	T	T	AT	–	T	T	A	–	–	T	TA	A	T	T	T	A*	T	T	T	T	AT	T
1907	1973 JAN 1	T	T	T	T	T	T	T	–	AT	T	–	–	TA	A	A	A	A	A	T	–	–	T	–	T	–	T	T
1908	JAN 28	T	A	T	T	T	T	T	T	A	TA	A	A	AT	TA	AT	TA	AT	–	A	A	T	T	T	T	T	T	T
1909	FEB 24	T	T	TA	T	T	–	TA	A	A	T	A	A	A	AT	A	A	A	TA	A	A	TA	A	A	T	T	T	T
1910	MAR 23	T	T	T	A	T	T	T	TA	A	TA	A	A	–	A	A	TA	A	A	AT	T–	–	T	T	T	T	T*	T*
1911	APR 19	T	AT	T-	T	T	T	A	T	T	TA	A	A	A*	A	AT	TA	A*	T	A	TA	T*	AT	A	T	A	T	A*
1912	MAY 16	T	T	T	T	T	T	TA	T	A	AT	T	A	A	A	A	A	A*	A	A	A	A	T*	-A	A	–	T	T
1913	JUN 12	T*	T	–	T	T*	A	T	T*	T*	T	T	AT	A	A	T	–	T	A	A	A	A*	AT	–	T	A	A	T
1914	JUL 9	T	T	A	T	T	A	T*	T*	A	AT	–	A	T	TA	T	T	T	A	A*	A	A*	TA	A	TA	T*	T*	T
1915	AUG 5	T	A	A	AT	A	T	T*	T	*	AT	T	AT	T	A	TA	T	T	A	A	AT	A*	AT	A	A	TA	A*	A
1916	SEP 1	TA*	T	T	AT	A	TA*	A	*	T	T	T	A	A	A	T	T	T	A	T	A	A*	A	T*	A	A	A*	A
1917	SEP 28	A*	A	AT	T	A	A	A	A	A*	T*	AT	T	T	T*	T	T*	T*	T	A	T	A*	A	A	A	T	A	T
1918	OCT 25	T	T	TA	A	A	T	T*	A	A	A	A	A	T	T	T	T	TA	T	T	*	A	A	A	TA	T	–	A
1919	NOV 21	*	T	–	A	A	T	T	T*	TA	A	A	A	A	TA	T	T	T	T*	T	T	T	T	A	A	T	–	T	A	TA	A	T
1920	DEC 18	TA	T	AT	A	A	T	T	AT	TA	A	T	A	*	A	A	A	*	AT	T	T	T	T	T	AT*							

Inferred IP Magnetic Field

The table shows daily inferences of the polarity of the interplanetary magnetic field made from magnetograms produced by a tri-axis magnetometer located at the Thule Geopole Station of the Air Weather Service. The inference relies on the discoveries of Mansurov (Geomagn. Aeron., 9, 622-623, 1969) and Svalgaard (Geophys. Pap. R-6, 11 pp., Dan. Meterol. Inst., Copenhagen, 1968) relating the variation of the polar cap magnetic field to the polarity of the interplanetary field. It was originally believed that the radial component (BXM in Geocentric Solar Magnetospheric coordinate system) of the IP field determined the effect observed in the polar cap field, but recent evidence (Friis-Christensen, et al., J. Geophys. Res., 77, 371, 1972) indicates the responsible component may be BYM, the component in the ecliptic plane perpendicular to BXM. As long as the IP field remains in a normal Archimedes spiral, the variation in sign of BYM maps one-to-one with the variation of sign of BXM.

The notation adapted for the table is that BXM>0 (BYM<0) is represented by the symbol A (away from the sun) and BXM<0 (BYM>0) is represented by the symbol T (toward the sun). A day with two polarities indicates that an inferred change of sign occurred during the interval approximately 1200 UT to 2000 UT, when the effect is observable at Thule. An asterisk along with an A or T indicates days when the effect was somewhat doubtful, but one polarity seemed predominant. An asterisk alone indicates days when no clear polarity effect could be discerned. A dash indicates days when missing data prevented inference of the polarity.

NOTE: THE FIELDS REPORTED HERE FOR THE FIRST HALF OF A FEW DAYS IN DECEMBER ARE INFERRED BY DR. MANSUROV FROM VOSTOK OBSERVATIONS.

NOVEMBER 1973 DATA

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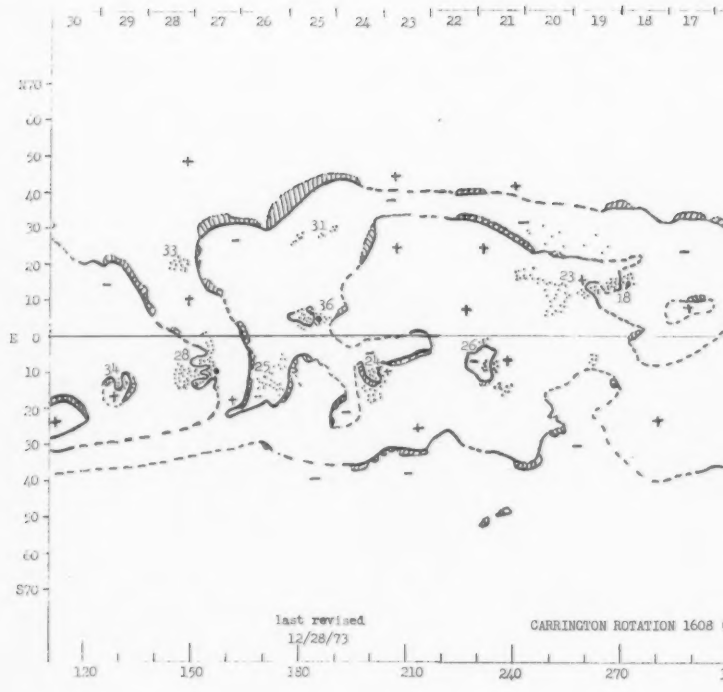
Errata: See page 101.

For explanations of the data contained herein see "Descriptive Text" published as supplement to February 1973 "Solar-Geophysical Data" (Number 342).

Hα SYNO

NO

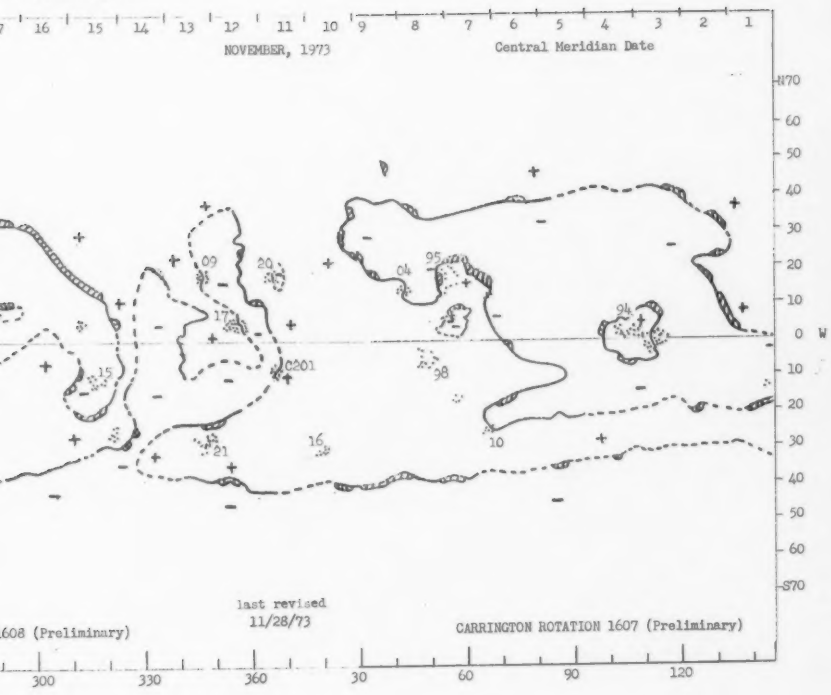


last revised
12/28/73

CARRINGTON ROTATION 1608

NOPTIC CHARTS

NOVEMBER 1973



25 Nov 73

NOVEMBER 1, 1973 (P = 24.57, B_o = 4.35,

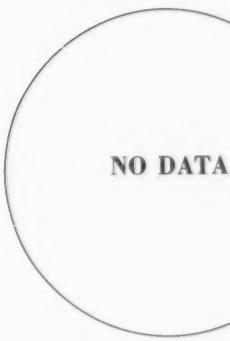
NASA GSFC
OSO-7

X-RAY
8-16A

PROSPECT HILL
AFCRL

Np

The tape recorder on OSO-7 failed in mid-May. Some of EUV and X-ray maps are incomplete because the period of direct contact with a tracking station is of short duration. The total counts given may also be low because of the incomplete coverage or high because of added background noise levels.



COUNT = 3991
ROLL = 7.1°
P-TH = 5.81

Sp
0345UT

Counts per 0.125 sec.

Sp

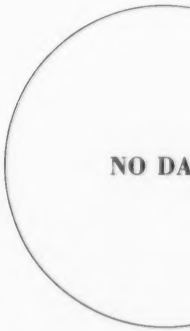
STANFORD

9.1 cm

FLEURS, AUSTRALIA

Np

N



E

W E

Operation of the Stanford Microwave Spectroheliograph ceased August 31, 1973. The first map of the series was for July 4, 1959. Virtually gap-free data exist from 1964. These maps have been published in *Solar-Geophysical Data* from April 1960. Each year the data were placed on a 600 foot 9 track reel of magnetic tape and are available from R. N. Bracewell, Radio Science Laboratory, Stanford University, Stanford, California 94305.

LOWEST CONTOUR = 40,000° K CONTOUR INTERVAL = 10,000° K

Sp
20-21 UT

Brightness Unit 5,000° K

S
02-03

6, L_o = 147.64)

MT. WILSON

DELTAY =
DELTAX =

Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus

Nov 26 73

8.6 mm

TA

W

E

NO DATA

W

Levels
±5
±10
±20
±40
±80

Contours in intervals
of 200° K

Sp

21 cm

McMATH-HULBERT

CALCIUM REPORT

N

Np

DATA

W E

W

GOOD	M
84 - 2300 - 3.5	
88 - 2000 - 2.5	
90 - 1400 - 3.5	
92 - 1100 - 3.0	
94 - 1000 - 3.5	

S

03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

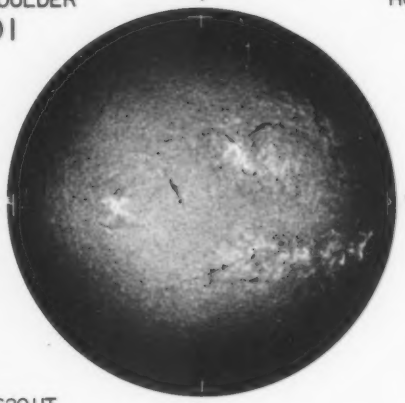
Sp

1515 UT

BOULDER
01

Np

Hα



E

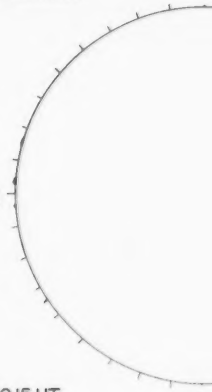
W

1620 UT

Sp

BOULDER

Np



E

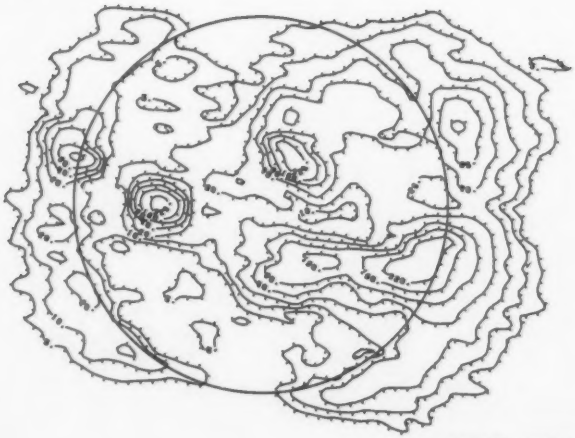
2015 UT

Sp

NASA GSFC
OSO-7

Np

FE XV
284A



E

W

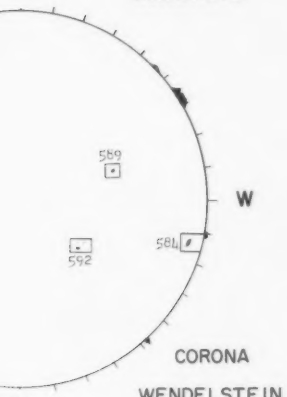
COUNT = 37661
ROLL = 7.1°
P-TH = 5.81

0345 UT

Sp

Np

SUNSPOTS



CORONA

WENDELSTEIN

Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA

2101-2237UT

Sp

Np

NRL
OSO-7

During the early part of June the NRL instrument began to suffer a gradual disintegration of the XUV filter which previously limited the wavelength to the band 170 - 630 Å. The band extends now to nearly 1600 Å, and the XUV image is diluted mainly with chromospheric Lyman-α radiation. The contrast is therefore low and the intensity count high.

171-630A

0341UT

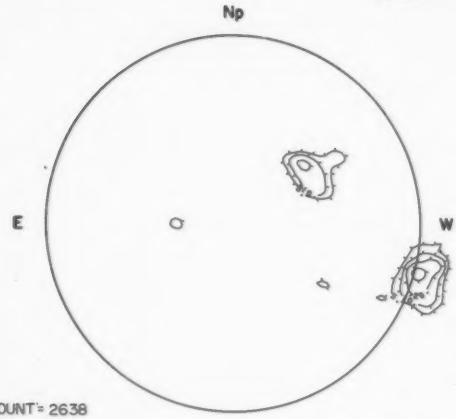
Sp

27
Nov 73

NOVEMBER 2, 1973 (P = 24.40, B_o = 4.25,

NASA GSFC
OSO-7

X-RAY
8-16A

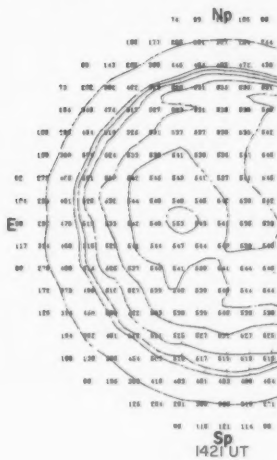


COUNT = 2638
ROLL = 7.1°
P-TH = 5.89

0409 UT

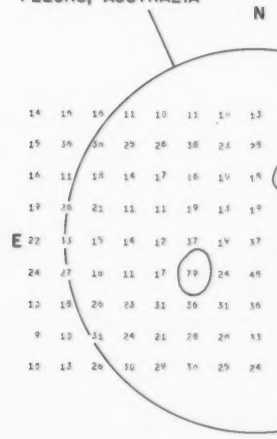
Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1421 UT

FLEURS, AUSTRALIA



02-03

5, L_o = 134.45)

MT. WILSON

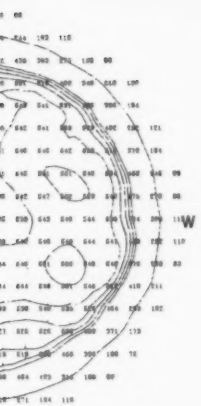
DELTAY =
DELTAX =

Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus

28 Nov 73

8.6 mm



E

W

NO DATA

Levels
±5
±10
±20
±40
±80

Contours in Intervals of 200° K

Sp

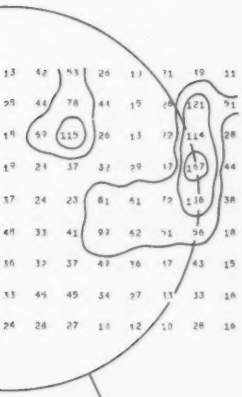
21 cm

McMATH-HULBERT

CALCIUM REPORT

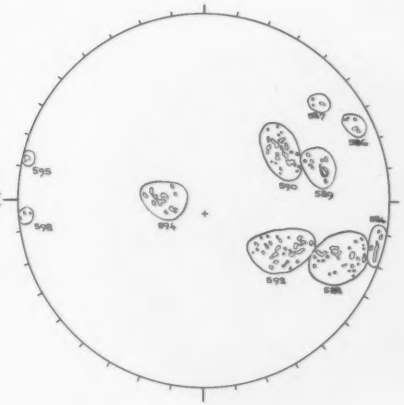
N

Np



W

E



W

POOR	S
84 - 2000 - 3.5	
88 - 1800 - 3.0	
90 - 1400 - 3.0	
92 - 1400 - 3.0	
94 - 1000 - 3.0	

S

-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

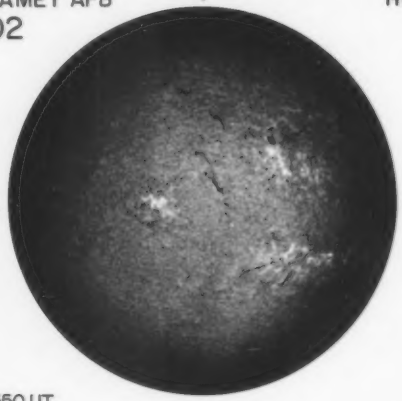
Sp

1605 UT

RAMEY AFB
02

Np

Hα



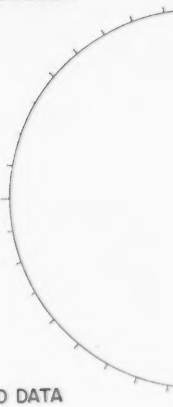
E

W

1550 UT

Sp

BOULDER



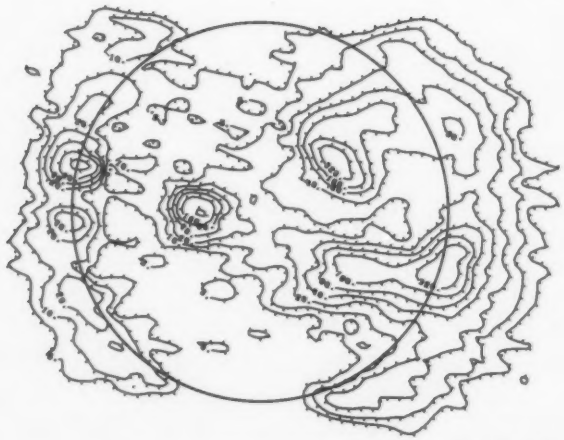
E

NO DATA

Np

NASA GSFC
OSO - 7

FE XV
284A



E

W

COUNT = 33252
ROLL = 7.1°
P-TH = 5.89

0409 UT

Sp

Np

SUNSPOTS

W

CORONA

NORIKURA

Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA

E

W

1657-2123UT

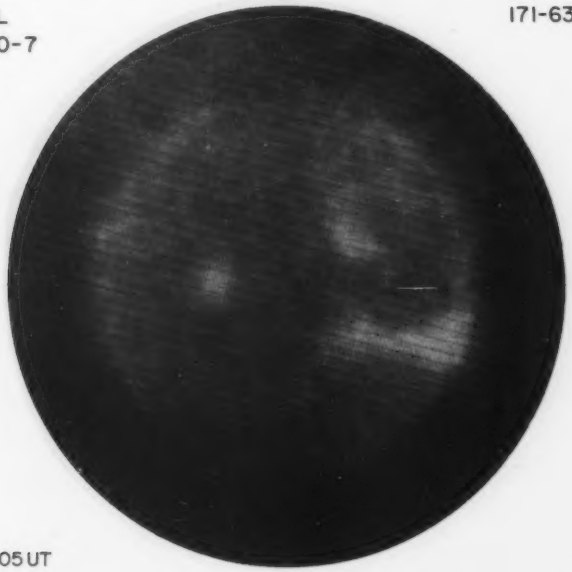
Sp

Np

NRL
OSO-7

171-630A

E



W

0405UT

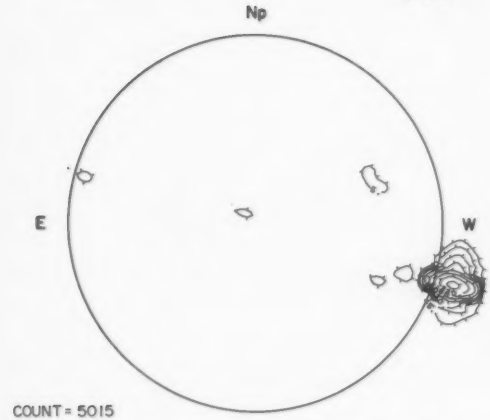
Sp

29
Nov 73

NOVEMBER 3, 1973 (P= 24.22, B_o= 4.15,

NASA GSFC
OSO-7

X-RAY
8-16A

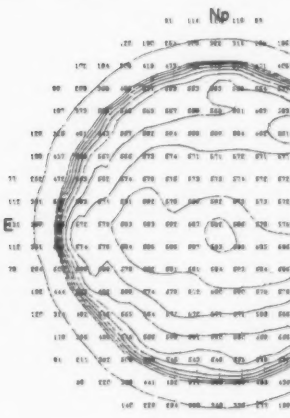


COUNT = 5015
ROLL = 6.2°
P-TH = 5.96

0254 UT

Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1714 UT

FLEURS, AUSTRALIA

N

E

NO DAT

S

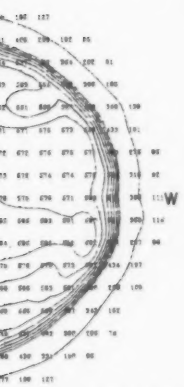
02-03 U

L_o = 121.26) MT. WILSON Np MAGNETOGRAM
Solid-Plus
Dotted-Minus

30 Nov 73

DELTAY =
DELTAX =

8.6 mm



E W

NO DATA

W

Levels
±5
±10
±20
±40
±80

Contours in Intervals of 200° K

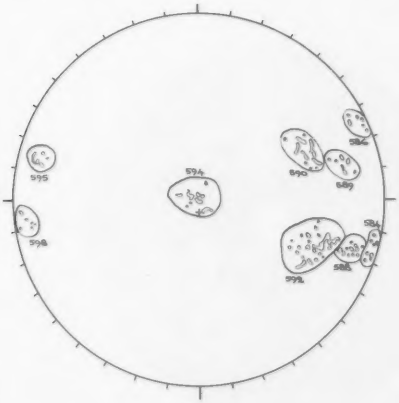
Sp

21 cm McMATH-HULBERT CALCIUM REPORT

Np

DATA

W E



W

FAIR	S
88 - 1100	- 2.5
90 - 1400	- 3.0
92 - 1800	- 3.0
94 - 0900	- 3.5

S

03 UT Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

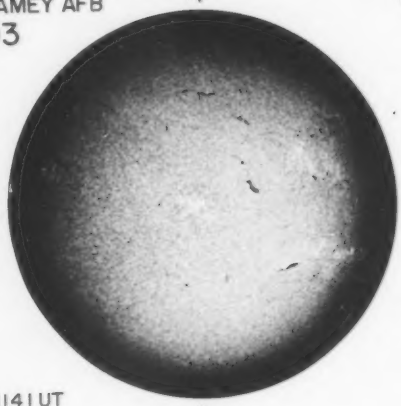
Sp

1415 UT

RAMEY AFB
03

Np

Hα



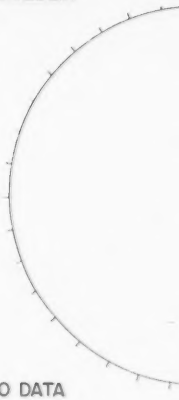
E

W

Sp

1141 UT

BOULDER



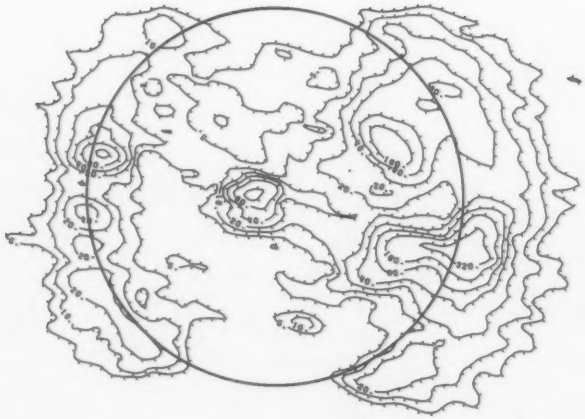
E

NO DATA

NASA GSFC
OSO-7

Np

FE XV
284 A



E

W

Sp

0254 UT

COUNT = 28501
ROLL = 6.2°
P-TH = 5.96

SUNSPOTS

CORONA

KISLOVODSK

NRL
OSO-7

WHITE-LIGHT
CORONA

SHADOW AREA CAUSED BY
OCCULTER SUPPORT

TV SCAN
DIRECTION

1639-2147UT

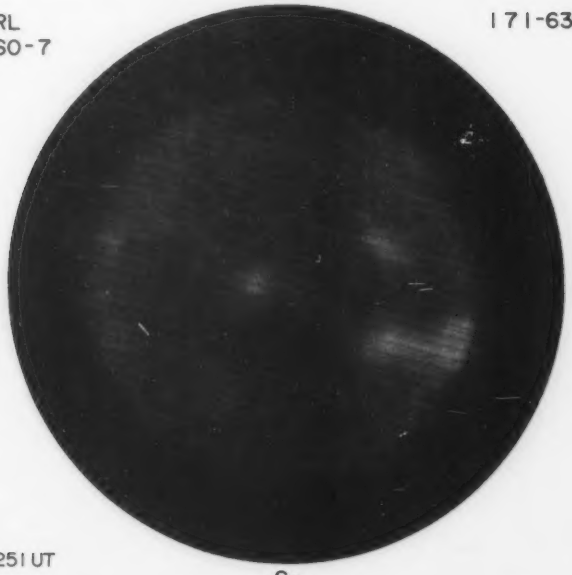
TWO DIAMETRAL
STREAKS, ALWAYS AT
90° TO SCAN DIRECTION

Sp

Np

NRL
OSO-7

171-630A



0251 UT

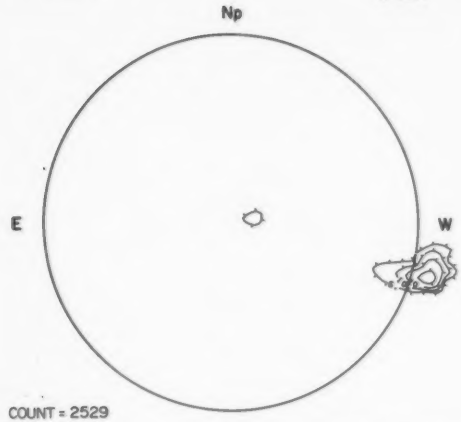
Sp

31
Nov 73

NOVEMBER 4, 1973 (P= 24.03, B_o = 4.04,

NASA GSFC
OSO-7

X-RAY
8-16A

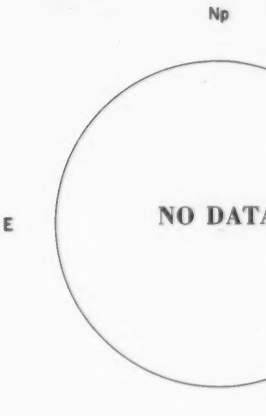


COUNT = 2529
ROLL = 5.6°
P-TH = 6.03

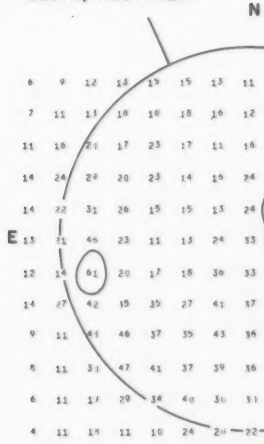
0316UT

Counts per 0.125 sec.

PROSPECT HILL
AFCRL



FLEURS, AUSTRALIA



02-0

04, L_o = 108.08)

MT. WILSON

DELTAY = 17.5
DELTAX = 14.1

8.6 mm

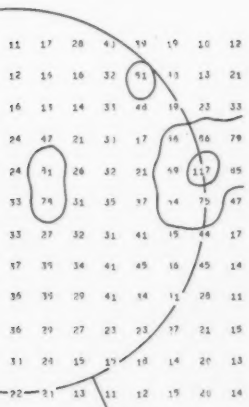
ATA

W

Contours in Intervals of 200° K

21 cm

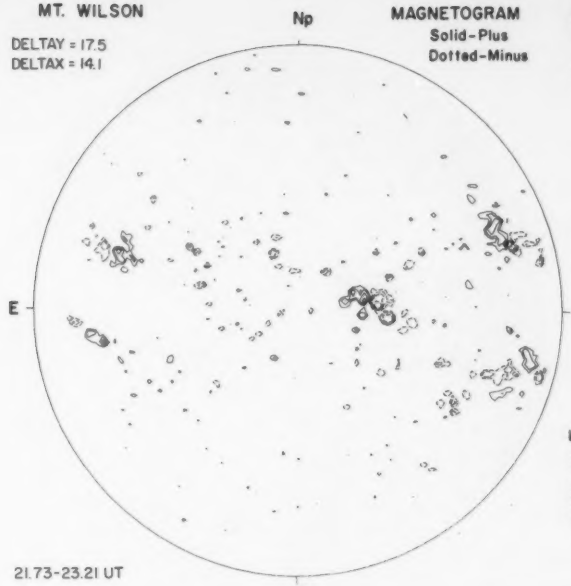
N



S

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

-03 UT



MAGNETOGRAM
Solid-Plus
Dotted-Minus

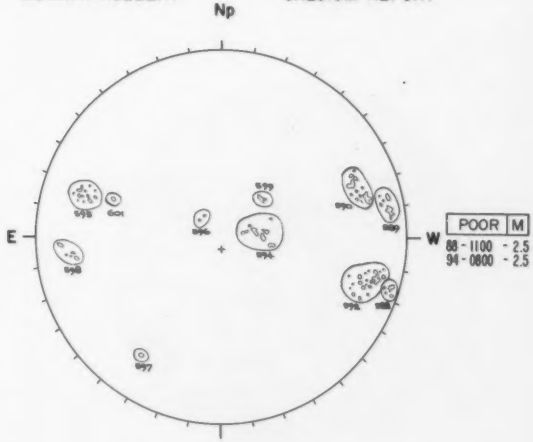
32 Nov 73

Levels
±5
±10
±20
±40
±80

21.73-23.21 UT

McMATH-HULBERT

CALCIUM REPORT



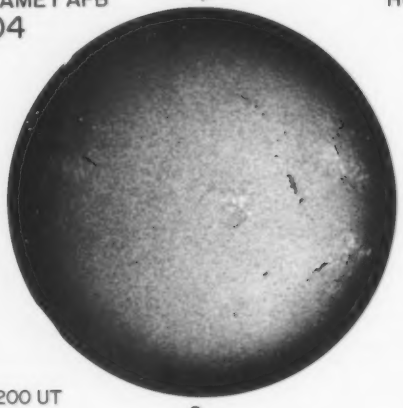
POOR	M
88 - 1100	- 2.5
94 - 0800	- 2.5

1500 UT

RAMEY AFB
04

Np

Hα



E

W

1200 UT

Sp

BOULDER

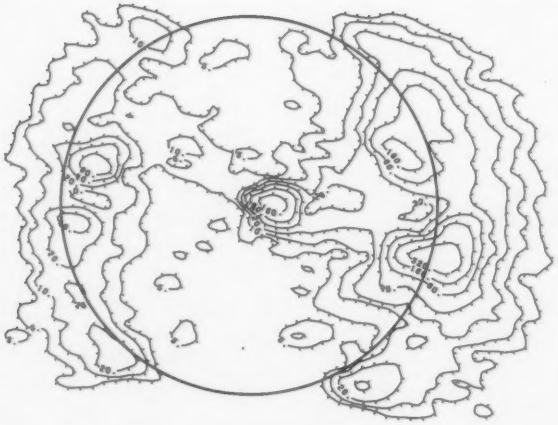
E

NO DATA

NASA GSFC
OSO - 7

Np

FE XV
284A



E

W

COUNT = 25905
ROLL = 5.6°
P-TH = 6.03

0316 UT

Sp

Np

SUNSPOTS

W

CORONA

KISLOVODSK

Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA

E

W

1719-2201 UT

Sp

Np

NRL
OSO-7

171-630A

E

W

0314 UT

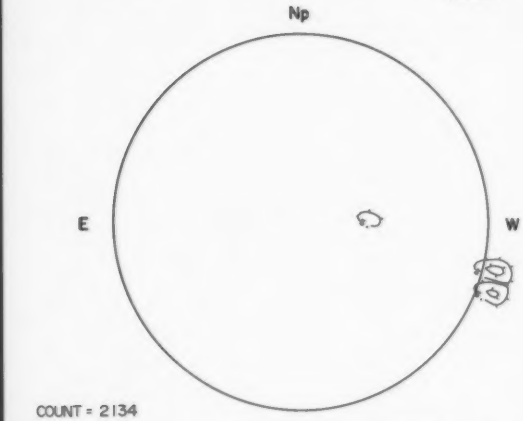
Sp

33
Nov 73

NOVEMBER 5, 1973 (P = 23.84, B_o = 3.94,

NASA GSFC
OSO-7

X-RAY
8-16A

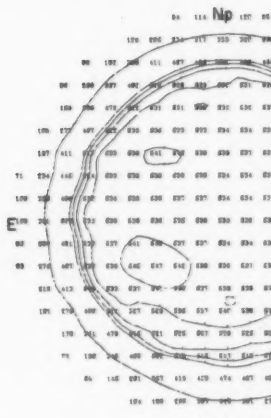


COUNT = 2134
ROLL = 5.7°
P-TH = 6.10

0339 UT

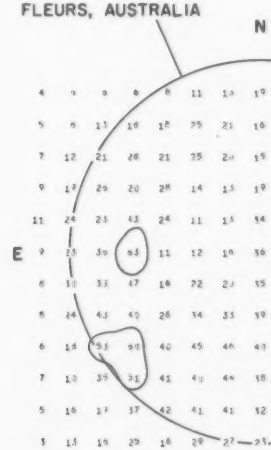
Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1834 UT

FLEURS, AUSTRALIA



02-03

94, L_o = 94.89)

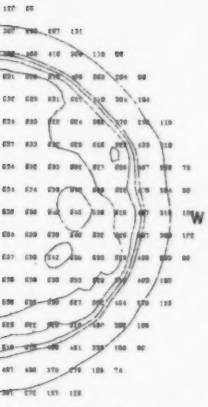
MT. WILSON

DELTAY = 17.5
DELTAX = 14.1

MAGNETOGRAM
Solid-Plus
Dotted-Minus

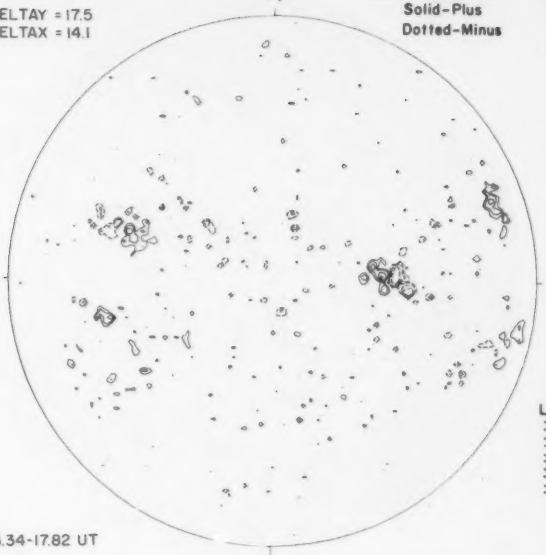
34
Nov 73

8.6 mm



Contours in Intervals of 200° K

UT



Levels
±5
±10
±20
±40
±80

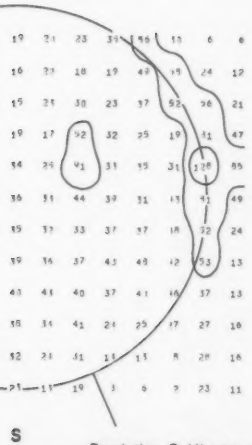
16.34-17.82 UT

21 cm

McMATH-HULBERT

CALCIUM REPORT

N



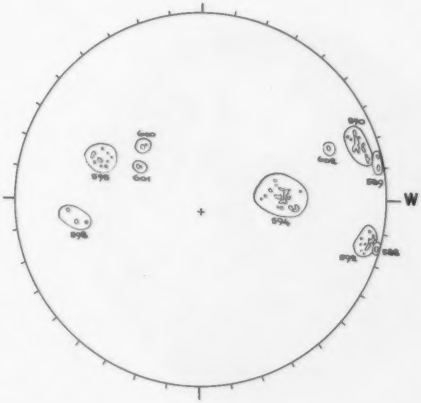
W

S

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

-03 UT

Np



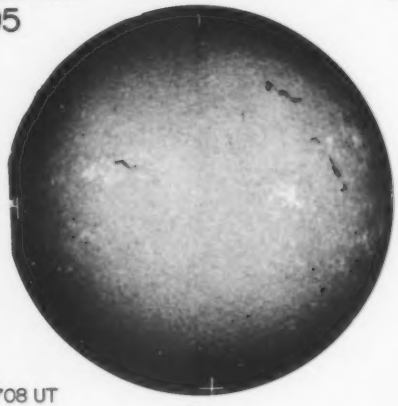
POOR | M
94 - 0800 - 2.5

1510 UT

BOULDER
05

Np

Hα



E

W

1708 UT

Sp

BOULDER

Np

E

NO SPOT

2000 UT

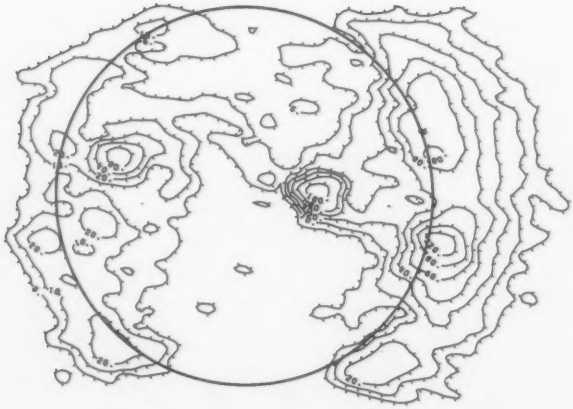
Sp

NASA GSFC
OSO-7

Np

FE XV
284A

E



W

COUNT= 21082
ROLL = 5.7°
P-TH = 6.10

0339 UT

Sp

Np

SUNSPOTS

SPOTS VISIBLE

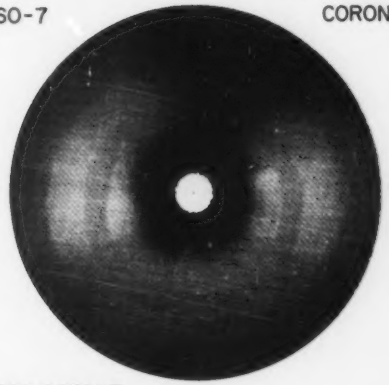
W

CORONA
KISLOVODSK
NO DATA 95°-120°

Sp

NRL
OSO-7

WHITE-LIGHT
CORONA



E

W

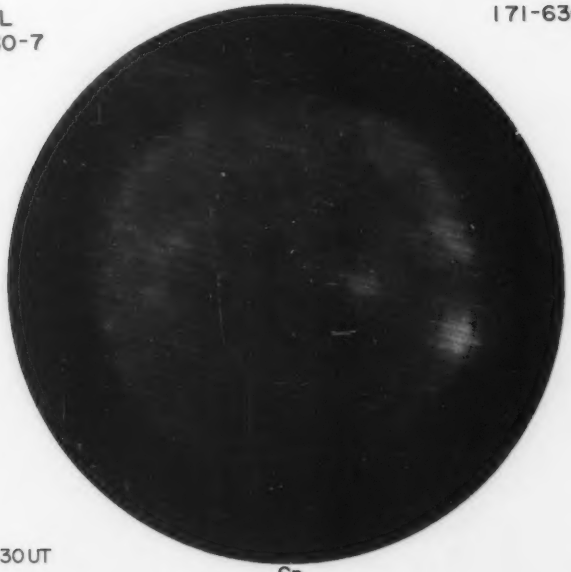
1742-2232 UT

Sp

Np

NRL
OSO-7

171-630A



E

W

1430 UT

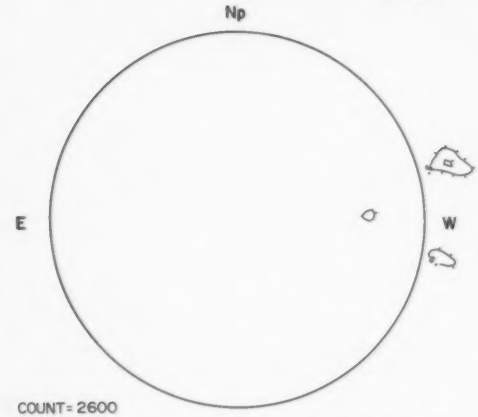
Sp

35
Nov 73

NOVEMBER 6, 1973 (P= 23.64, B_o= 3.83,

NASA GSFC
OSO-7

X-RAY
8-16A

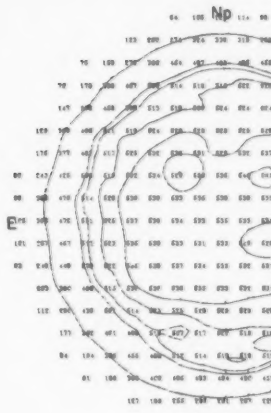


COUNT= 2600
ROLL = 6.2°
P-TH = 6.20

1455 UT

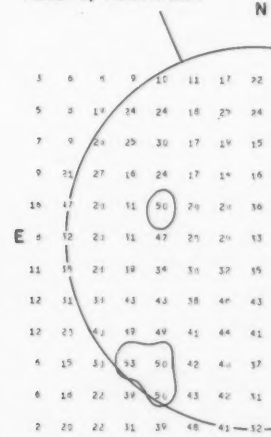
Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1412 UT

FLEURS, AUSTRALIA



S

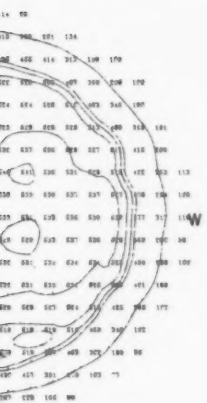
02-0

3, $L_o = 81.71$)

MT. WILSON

DELTAY = 17.6
DELTAX = 14.1

8.6 mm



Contours in Intervals of 200° K

Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus

36 Nov 73

E

W

Levels
±5
±10
±20
±40
±80

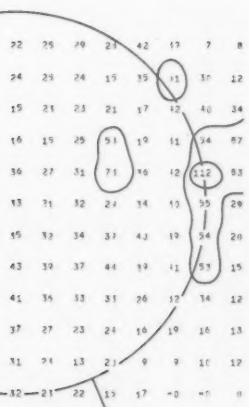
16.07-17.53 UT

Sp

21 cm

McMATH-HULBERT CALCIUM REPORT

N



W

Np

E

W

FAIR | S
04 - 0800 - 3.0
02 - 0100 - 2.5

S

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

2-03 UT

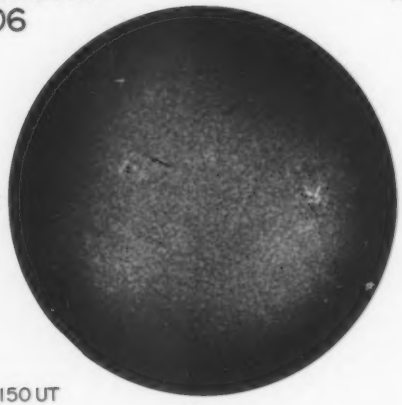
Sp

1430 UT

RAMEY AFB
06

Np

Hα



E

W

1150 UT

Sp

BOULDER

N

E

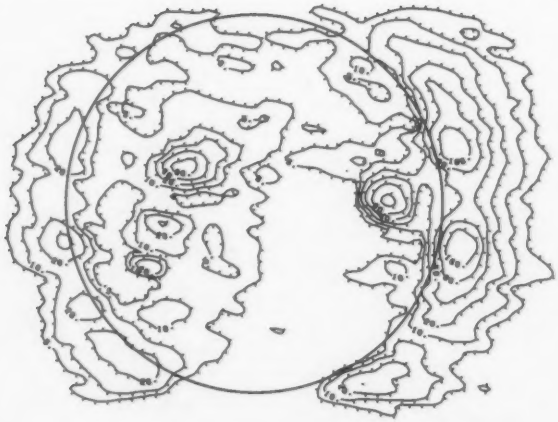
NO DATA

S

NASA GSFC
OSO - 7

Np

FE XV
284A



E

W

COUNT = 17680
ROLL = 6.2°
P-TH = 6.20

1455 UT

Sp

Np

SUNSPOTS

W

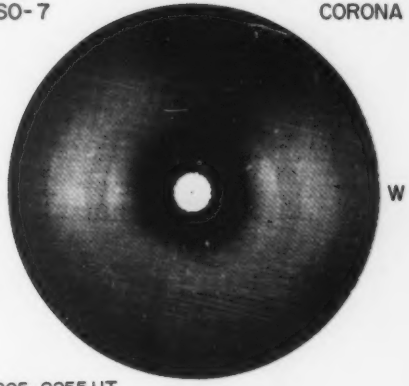
CORONA
KISLOVODSK
NO DATA 95°-125°

Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA



E

W

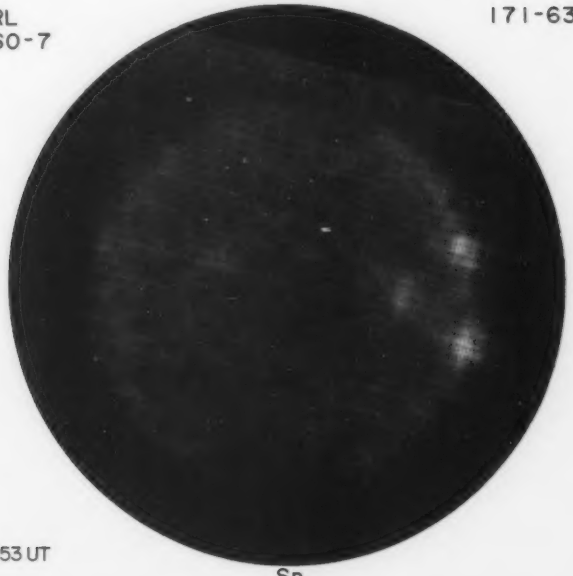
1805-2255 UT

Sp

Np

NRL
OSO-7

171-630A



E

W

1453 UT

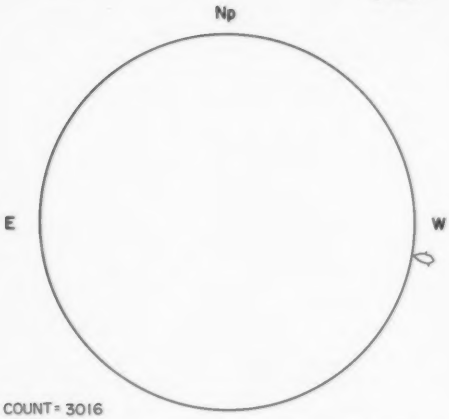
Sp

37
Nov 73

NOVEMBER 7, 1973 (P= 23.43, B_o= 3.72,

NASA GSFC
OSO-7

X-RAY
8-16A

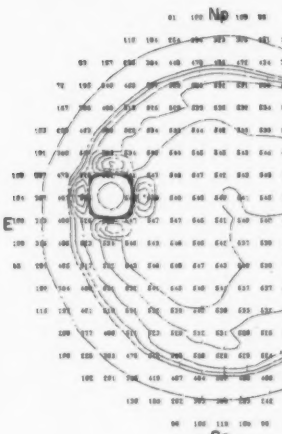


COUNT= 3016
ROLL = 6.0°
P-TH = 6.27

1517 UT

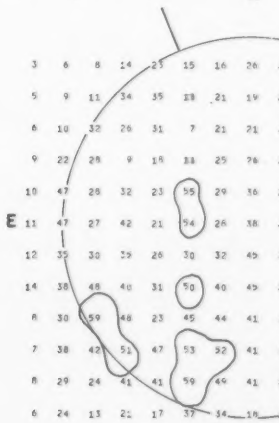
Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1435 UT

FLEURS, AUSTRALIA



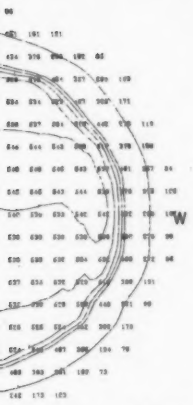
02-03

, $L_o = 68.52$)

MT. WILSON

DELTAY =17.5
DELTAX =14.1

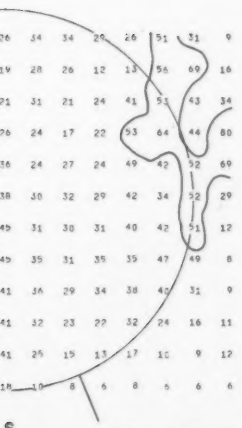
8.6 mm



Contours in Intervals of 200° K

21 cm

N



S

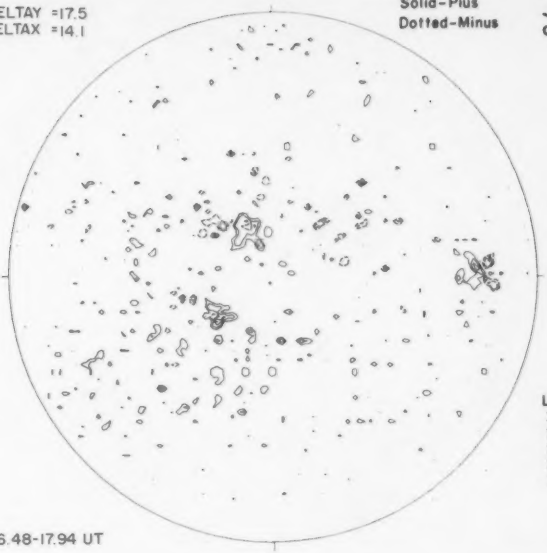
03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus

38 Nov 73



E W

Levels
±5
±10
±20
±40
±80

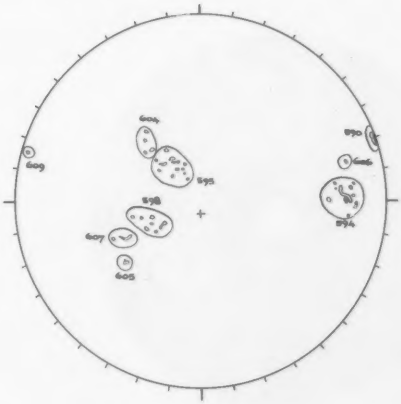
16.48-17.94 UT

Sp

McMATH-HULBERT

CALCIUM REPORT

Np



E W

FAIR M
94 - 0800 - 3.0
09 - 0200 - 3.0

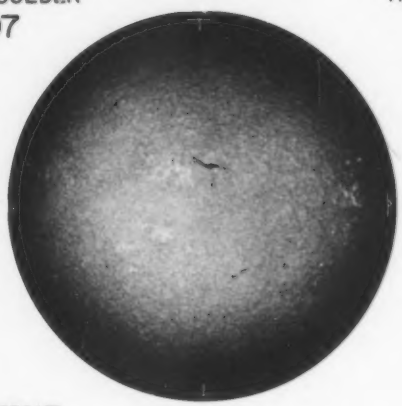
Sp

1430 UT

BOULDER
07

Np

Hα



E

W

Sp

1552 UT

BOULDER

Np

E

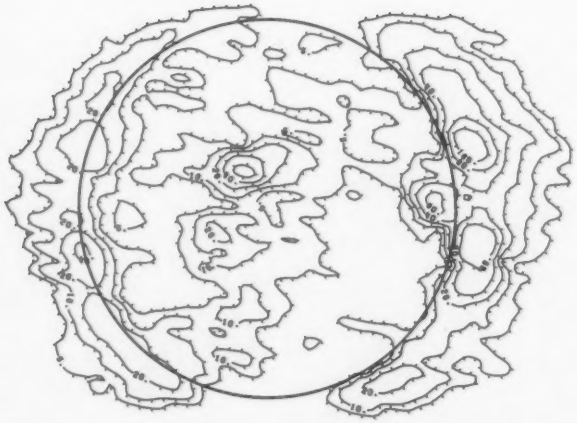
1615 UT

S

NASA GSFC
OSO-7

Np

FE XV
284A



E

W

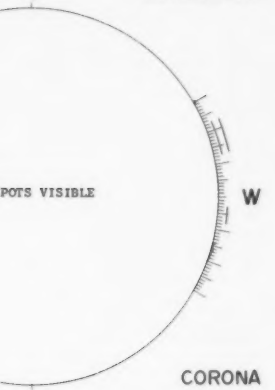
COUNT = 15530
ROLL = 6.0°
P-TH = 6.27

1517 UT

Sp

Np

SUNSPOTS

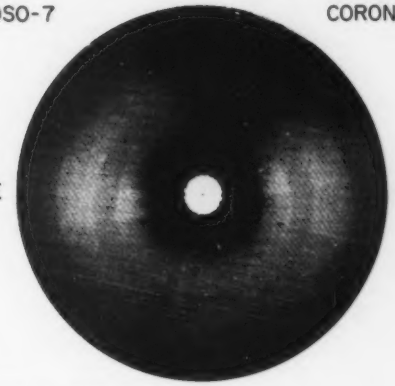


CORONA
NORIKURA

Sp

NRL
OSO-7

WHITE-LIGHT
CORONA



1651-2141 UT

Sp

Np

171-630A

E

NO DATA

W

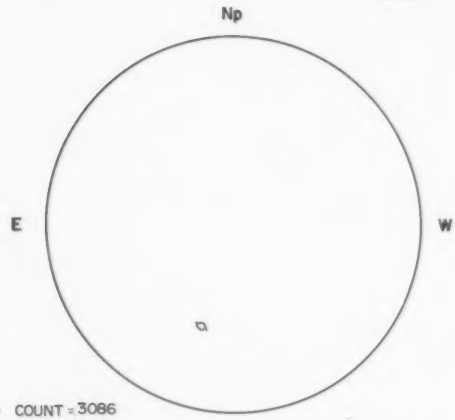
Sp

39
Nov 73

NOVEMBER 8, 1973 (P= 23.21, B_o= 3.61,

NASA GSFC
OSO-7

X-RAY
8-16A

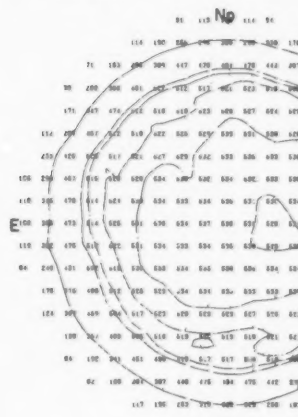


COUNT = 3086
ROLL = 5.9°
P-TH = 6.34

2029 UT

Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1325 UT

FLEURS, AUSTRALIA

N

E

NO DAT

S

02-03 U

$L_o = 55.34$)

MT. WILSON

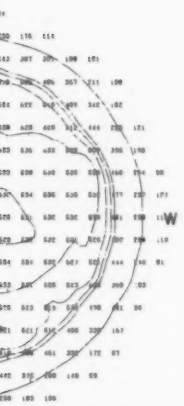
DELTAY =
DELTAX =

Np

MAGNETOGRAM
Solid - Plus
Dotted - Minus

Nov 73 40

8.6 mm



Contours in Intervals of 200° K

E

NO DATA

W

Levels
±5
±10
±20
±40
±80

Sp

21 cm

McMATH-HULBERT

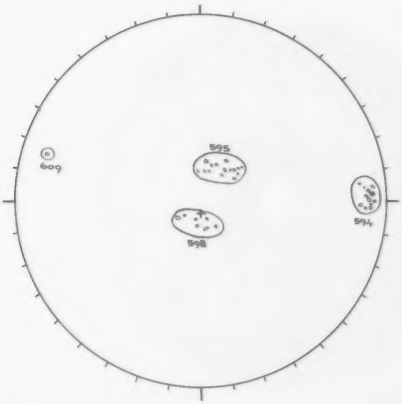
CALCIUM REPORT

Np

ATA

W

E



W

FAIR | M
09 - 0200 - 3.0

Sp

03 UT

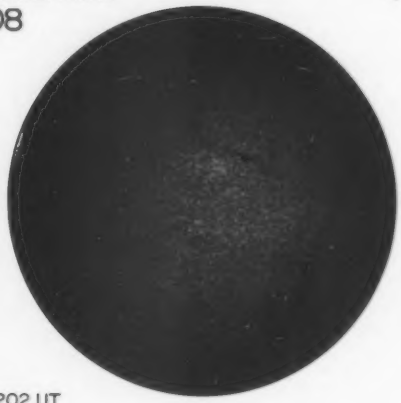
Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

1810 UT

RAMEY AFB
08

Np

Hα



E

W

1202 UT

Sp

BOULDER

N

E

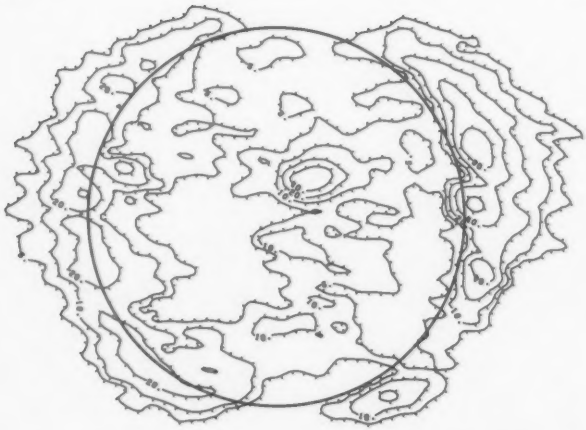
NO DATA

S

NASA GSFC
OSO-7

Np

FE XV
284A



E

W

COUNT = 12856
ROLL = 5.9°
P-TH = 6.34

2029 UT

Sp

Np

SUNSPOTS

W

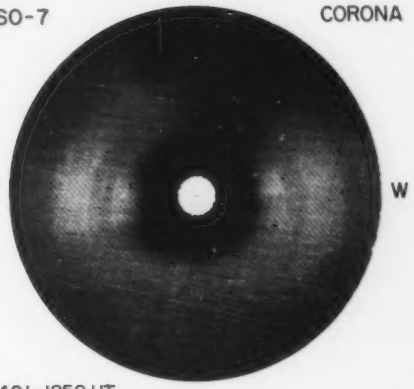
CORONA

PIC DU MIDI

Sp

NRL
OSO-7

WHITE-LIGHT
CORONA



E

W

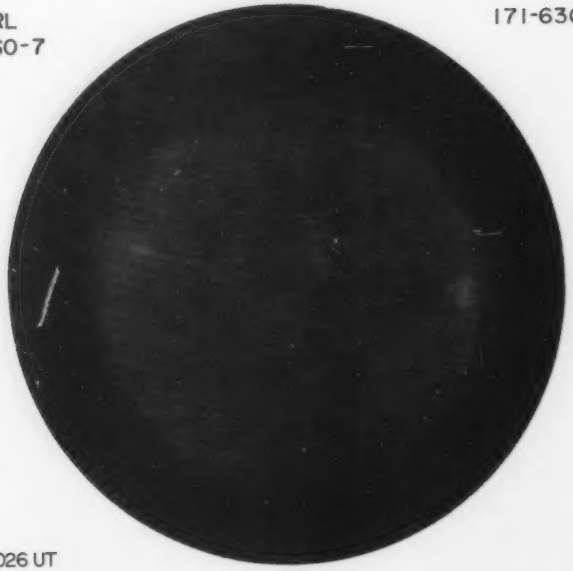
1401-1850 UT

Sp

Np

NRL
OSO-7

171-630A



E

W

2026 UT

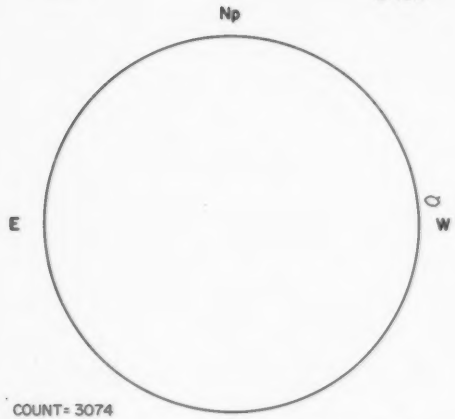
Sp

41
Nov 73

NOVEMBER 9, 1973 (P = 22.99, B_o = 3.50,

NASA GSFC
OSO-7

X-RAY
8-16A

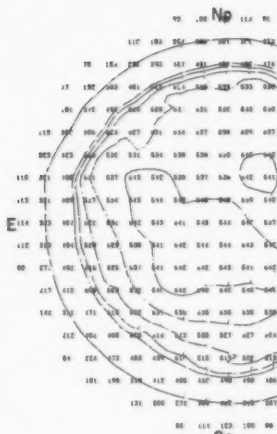


COUNT = 3074
ROLL = 5.7°
P-TH = 6.39

1425 UT

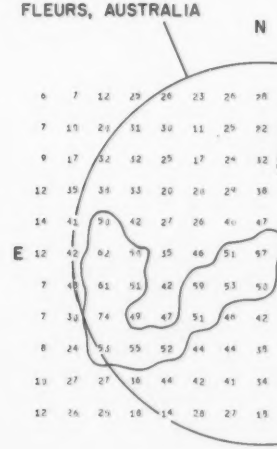
Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1513 UT

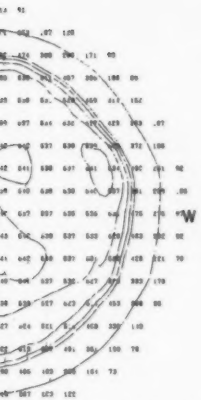
FLEURS, AUSTRALIA



02-03

60, L_o = 42.15)

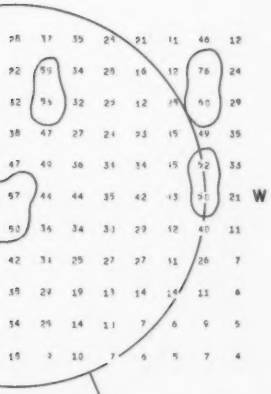
8.6 mm



Contours in Intervals of 200° K

21 cm

N

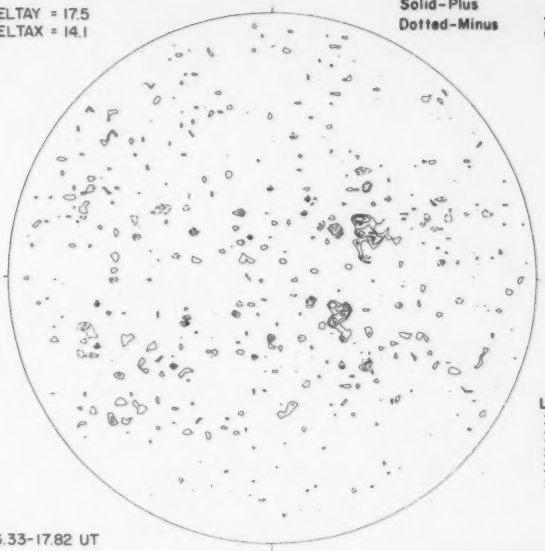


S

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

MT. WILSON

DELTAY = 17.5
DELTAX = 14.1

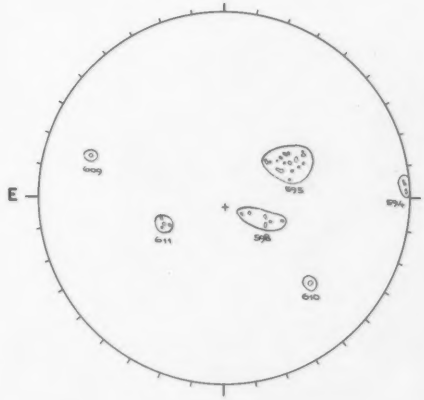


MAGNETOGRAM
Solid-Plus
Dotted-Minus

Levels
±5
±10
±20
±40
±80

16.33-17.82 UT

McMATH-HULBERT



1530 UT

CALCIUM REPORT

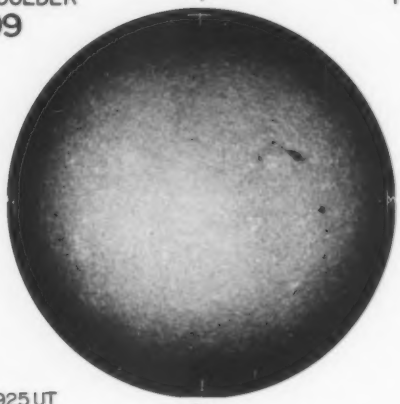
POOR | S
09-0100 - 2.5

42
Nov 73

BOULDER
09

Np

Hα



E

W

1925 UT

Sp

BOULDER

N

E

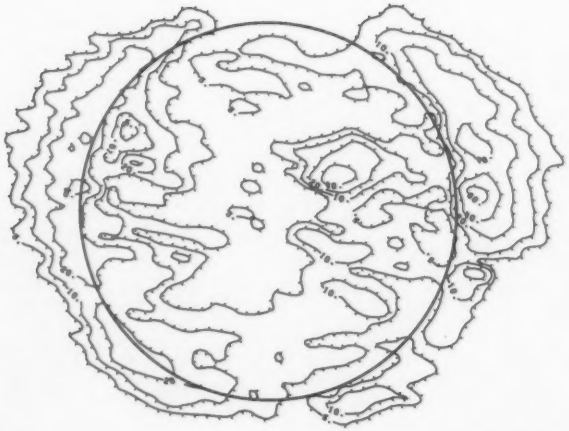
1830 UT

S

NASA GSFC
OSO-7

Np

FE XV
284A



E

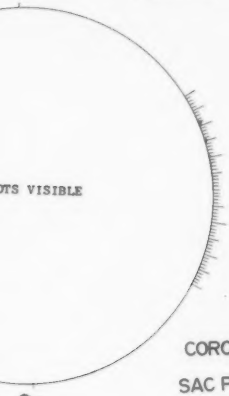
W

COUNT = 11962
ROLL = 5.7°
P-TH = 6.39

1425 UT

Sp

Np SUNSPOTS



W

Sp

NRL
OSO-7

E

Np WHITE-LIGHT
CORONA

NO DATA

W

CORONA
SAC PEAK

Sp

Np

171-630A

NRL
OSO-7

E

NO DATA

W

Sp

43
Nov 73

NOVEMBER 10, 1973 (P = 22.75, B_o = 3.3

NASA GSFC
OSO-7

X-RAY
8-16A

Np

E

NO DATA

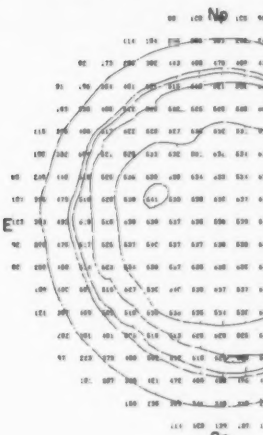
W

COUNT =
ROLL =
P-TH =

Sp

Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1537 UT

FLEURS, AUSTRALIA

N

E

NO D

S

02-0

3.39, L_o = 28.97)

MT. WILSON

DELTAY = 17.6
DELTAX = 14.1

MAGNETOGRAM
Solid - Plus
Dotted - Minus

44
Nov 73

Np

E

W

Sp

Levels
±5
±10
±20
±40
±80

15.96-17.55 UT

8.6 mm

W

Contours in Intervals of 200° K

UT

21 cm

McMATH-HULBERT

CALCIUM REPORT

N

Np

DATA

W E W

FAIR S
13 - 0200 - 2.5
14 - 0200 - 2.5

S

2-03 UT

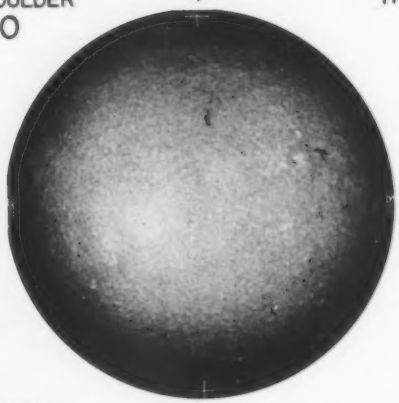
Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

Sp
2015 UT

BOULDER
10

Np

Hα



E

W

1614 UT

Sp

BOULDER

N

E

NO DATA

S

NASA GSFC
OSO - 7

Np

FE XV
284 A

E

NO DATA

W

Sp

Np

SUNSPOTS

W

CORONA

Sp

KISLOVODSK

NRL
OSO-7

E

NO DATA

Np

WHITE-LIGHT
CORONA

W

Sp

Np

NRL
OSO-7

171-630A

E

NO DATA

W

Sp

45
Nov 73

NOVEMBER 11, 1973 (P = 22.51, B_o = 3.2

NASA GSFC
OSO-7

X-RAY
8-16A

Np

E

NO DATA

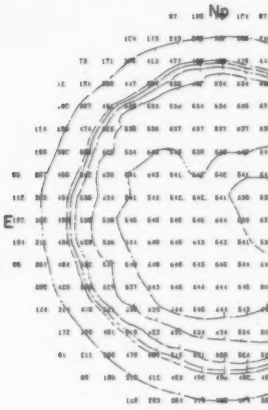
W

COUNT =
ROLL =
P-TH =

Sp

Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1633 UT

FLEURS, AUSTRALIA

N

E

NO D

S

02-0

3.28, L_o = 15.79)

MT. WILSON

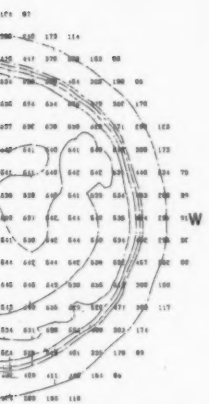
DELTAY =
DELTAX =

Np

MAGNETOGRAM
Solid - Plus
Dotted - Minus

46
Nov 73

8.6 mm



E

NO DATA

W

Levels
±5
±10
±20
±40
±80

Contours in Intervals of 200° K

UT

Sp

21 cm

CALCIUM REPORT

N

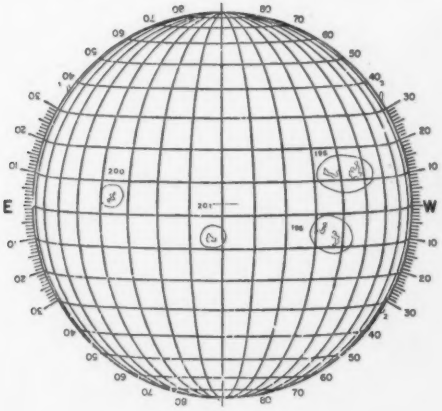
CATANIA

Np

DATA

W

E



W

FAIR GD
96 - 0526 ---

S

2-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

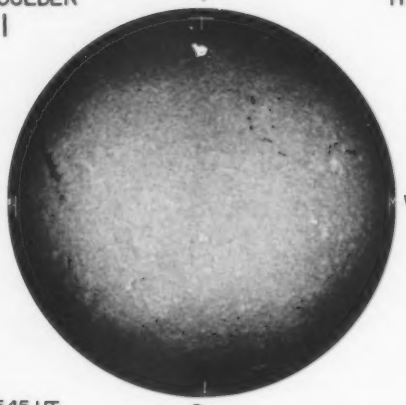
Sp

0935 UT

BOULDER
II

Np

Hα



E

W

1545 UT

Sp

BOULDER

N

E

Catanfa

1650 UT

S

NASA GSFC
OSO-7

Np

FE XV
284A

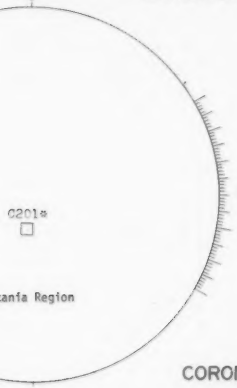
E

NO DATA

W

Sp

Np SUNSPOTS



Sp

NRL
OSO-7

CORONA
KISLOVODSK

Np WHITE-LIGHT CORONA

E NO DATA W

Sp

Np

NRL
OSO-7

171-630A

E NO DATA W

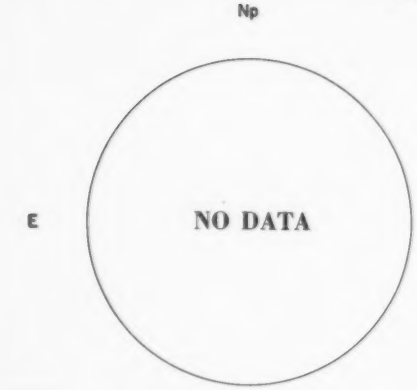
Sp

47
Nov 73

NOVEMBER 12, 1973 (P= 22.27, B_o = 3.16,

NASA GSFC
OSO-7

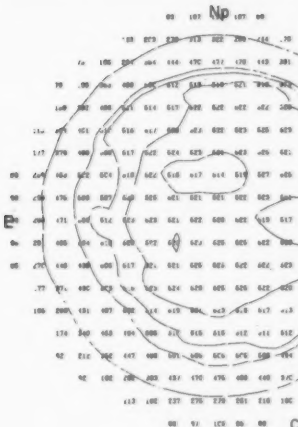
X-RAY
8-16A



COUNT =
ROLL =
P-TH =

Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1431 UT

FLEURS, AUSTRALIA

02-03 UT

6, L_o = 2.60)

MT. WILSON

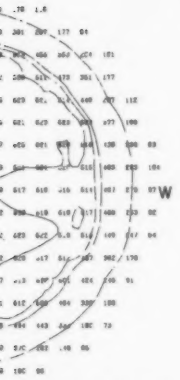
DELTAY =
DELTAX =

Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus

48
Nov 73

8.6 mm



E

NO DATA

W

Levels
± 5
± 10
± 20
± 40
± 80

Contours in Intervals
of 200° K

Sp

21 cm

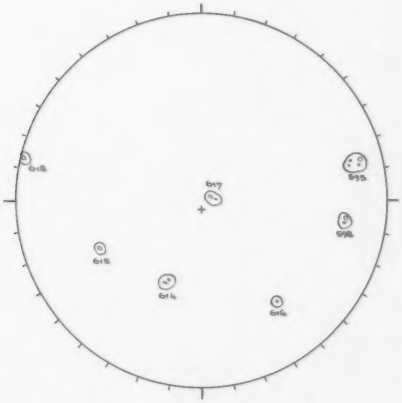
McMATH-HULBERT

CALCIUM REPORT

Np

ATA

W E



W

POOR | M
18 - 0200 - 2.5

Sp

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

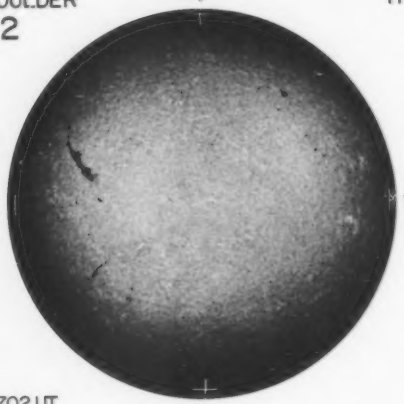
3 UT

1945 UT

BOULDER
12

Np

Hα



E

W

Sp

1702 UT

BOULDER

E

1730 UT

NASA GSFC
OSO - 7

Np

FE XV
284A

E

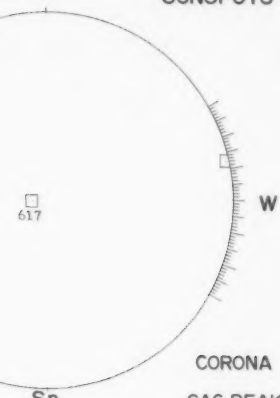
NO DATA

W

Sp

Np

SUNSPOTS



CORONA

SAC PEAK

NRL
OSO-7

Np

WHITE-LIGHT
CORONA

E

NO DATA

W

Sp

Np

NRL
OSO-7

171-630 A

E

NO DATA

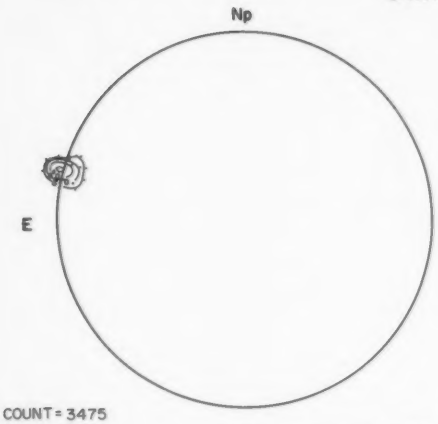
W

Sp

NOVEMBER 13, 1973 (P = 22.01, B_o = 3.

NASA GSFC
OSO-7

X-RAY
8-16A

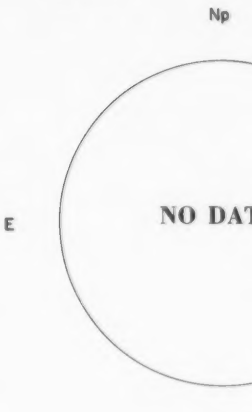


COUNT = 3475
ROLL = 3.1°
P-TH = 6.61

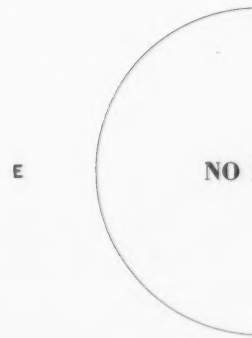
1242 UT

Counts per 0.125 sec.

PROSPECT HILL
AFCRL



FLEURS, AUSTRALIA



02-

3.05, L_o = 349.42)

MT. WILSON

DELTAY =
DE

8.6 mm

Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus

50
Nov 73

p

ATA

E

W

NO DATA

W

Levels
±5
±10
±20
±40
±80

p

Contours in Intervals
of 200° K

Sp

21 cm

N

CATANIA

Np

CALCIUM REPORT

O DATA

W

E

W

FAIR GD
04-1982 ---

S

02-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

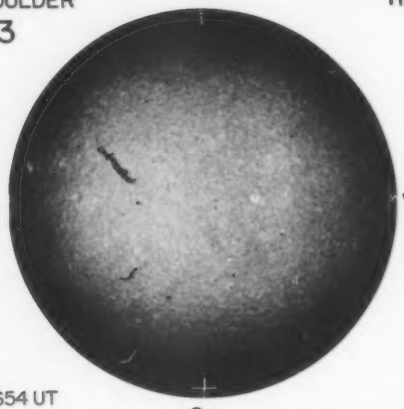
Sp

0822 UT

BOULDER
13

Np

Hα



E

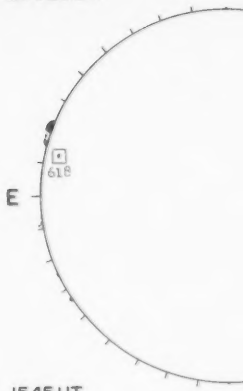
W

Sp

1654 UT

BOULDER

Np



E

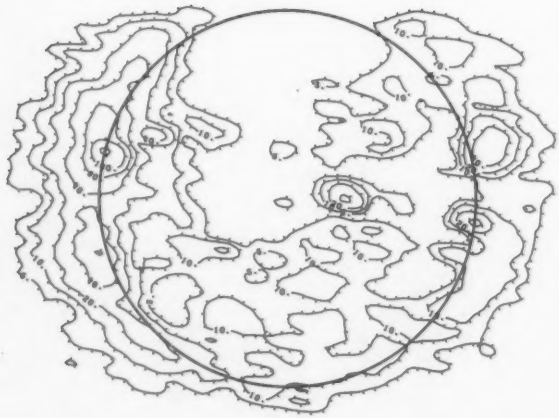
Sp

1545 UT

Np

NASA GSFC
OSO-7

FE XV
284A



E

W

COUNT = 14809
ROLL = 3.1°
P-TH = 6.61

1242 UT

Sp

Np

SUNSPOTS

CORONA
SAC PEAK

Sp

NRL
OSO-7

Np

E

NO DATA

W

Sp

Np

WHITE-LIGHT
CORONA

W

NRL
OSO-7

171-630A

E

NO DATA

W

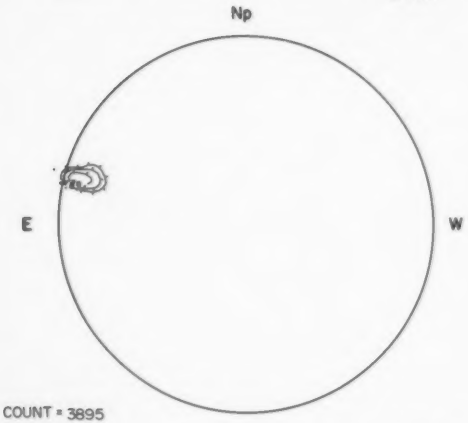
Sp

51
Nov 73

NOVEMBER 14, 1973 (P = 21.75, B_o = 2.93

NASA GSFC
OSO-7

X-RAY
8-16A

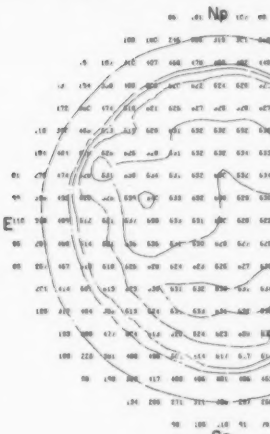


COUNT = 3895
ROLL = 2.9°
P-TH = 6.67

1305 UT

Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1535 UT

FLEURS, AUSTRALIA

N

E

NO D

S

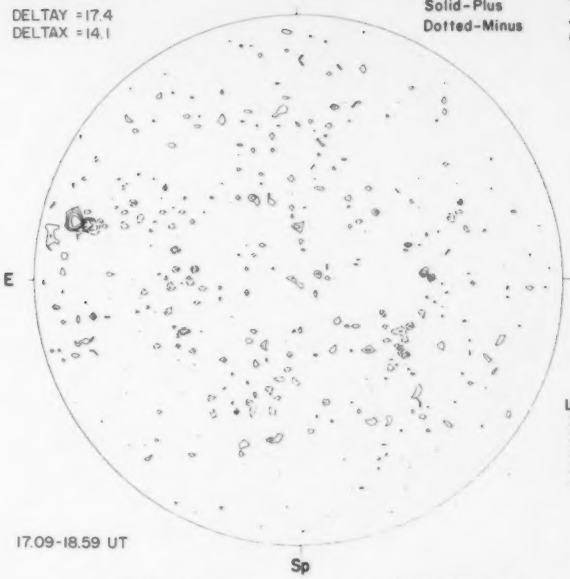
02-03

.93, L_o = 336.23)

MT. WILSON

DELTAY = 17.4
DELTAX = 14.1

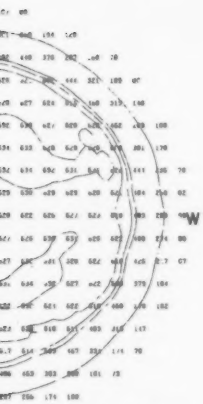
MAGNETOGRAM
Solid-Plus
Dotted-Minus



Levels
± 5
± 10
± 20
± 40
± 80

17.09-18.59 UT

8.6 mm



Contours in Intervals
of 200° K

UT

21 cm

McMATH-HULBERT

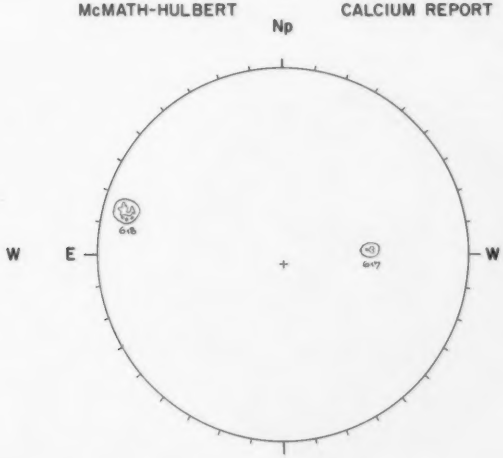
CALCIUM REPORT

N

S

2-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K



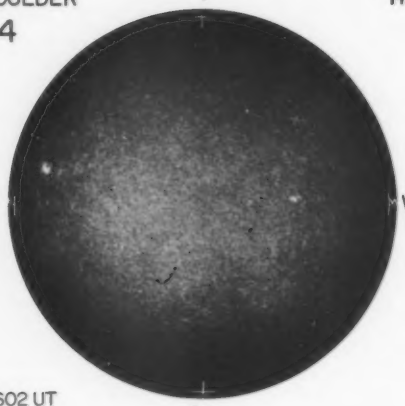
GOOD	M
18 - 1000	- 3.0

1445 UT

BOULDER
14

Np

Hα



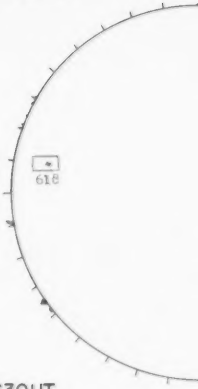
E

W

1602 UT

Sp

BOULDER



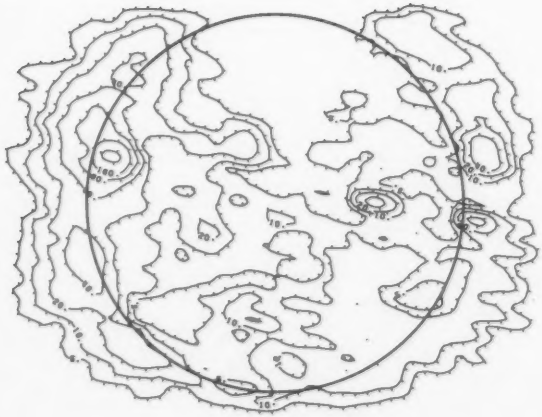
E

1630UT

Np

NASA GSFC
OSO-7

FE XV
284A



E

W

COUNT = 16556
ROLL = 2.9°
P-TH = 6.67

1305 UT

Sp

Np

SUNSPOTS

W

CORONA

PIC DU MIDI

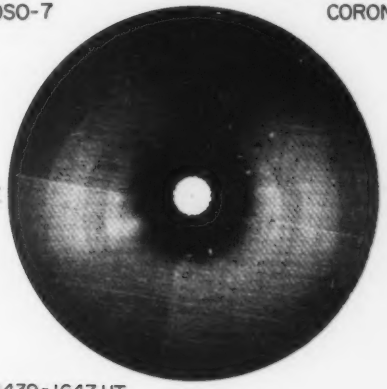
Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA

E



W

1439-1647 UT

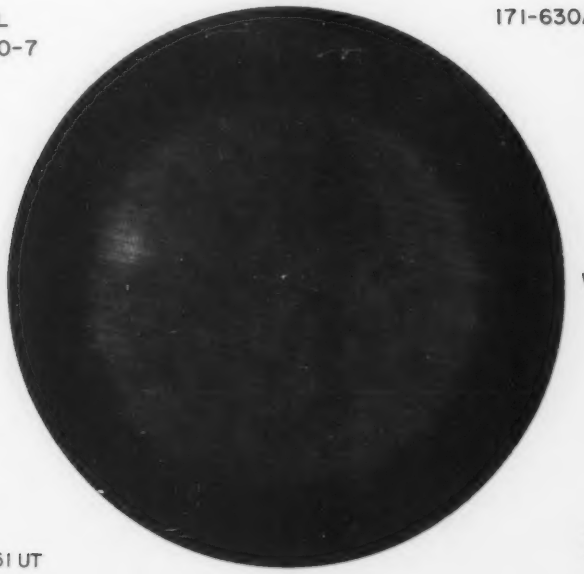
Sp

Np

NRL
OSO-7

171-630A

E



W

1751 UT

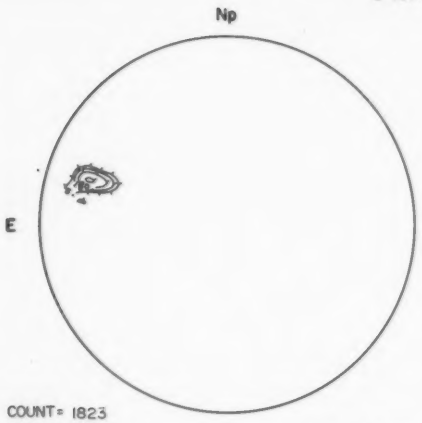
Sp

53
Nov 73

NOVEMBER 15, 1973 (P= 21.48, B_o= 2.82

NASA GSFC
OSO-7

X-RAY
8-16A

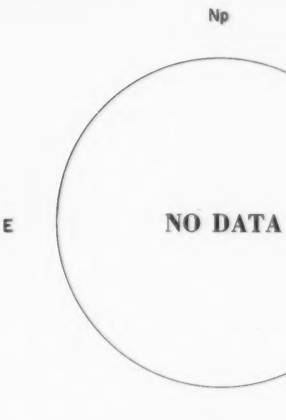


COUNT= 1823
ROLL = 2.8°
P-TH = 6.71

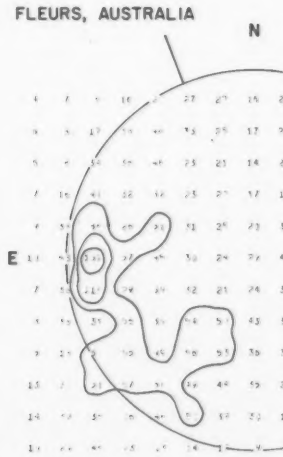
1227 UT

Counts per 0.125 sec.

PROSPECT HILL
AFCRL



FLEURS, AUSTRALIA



02-03

.82, L_o = 323.05)

MT. WILSON

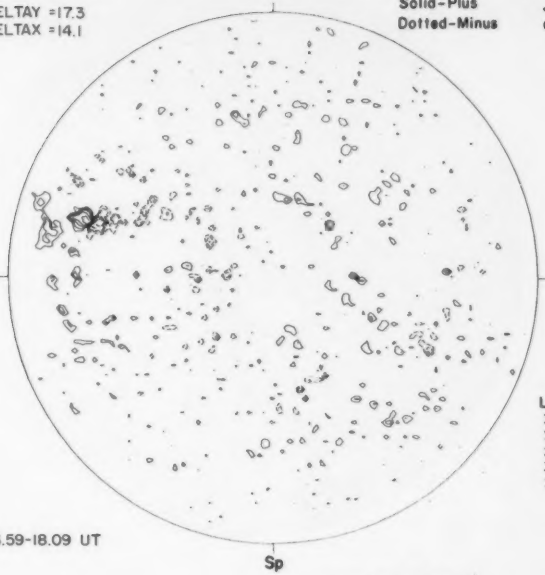
DELTAY =17.3
DELTAX =14.1

8.6 mm

TA

W

Contours in Intervals of 200° K



MAGNETOGRAM
Solid-Plus
Dotted-Minus

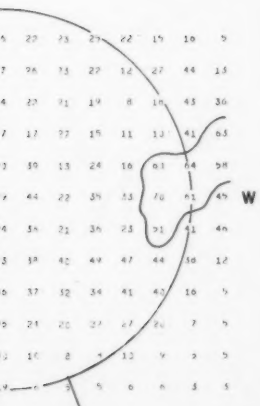
Levels
±5
±10
±20
±40
±80

16.59-18.09 UT

54
Nov 73

21 cm

N



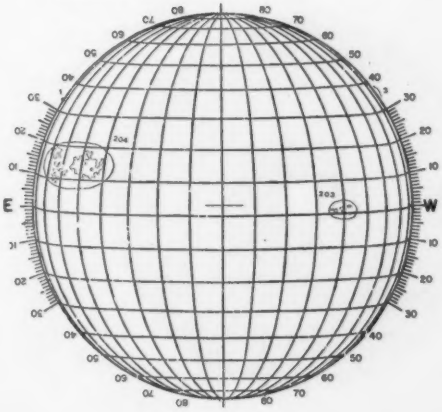
W

S

03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

CATANIA



CALCIUM REPORT

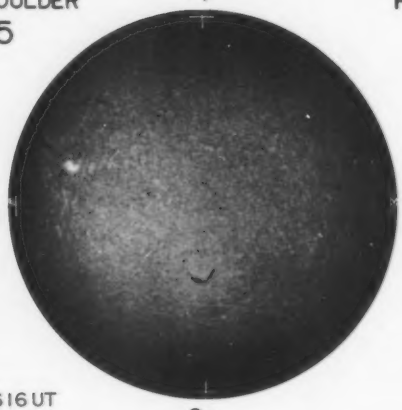
FAIR GD
04-4459 ---

0817 UT

BOULDER
15

Np

Hα



E

W

Sp

1616 UT

BOULDER

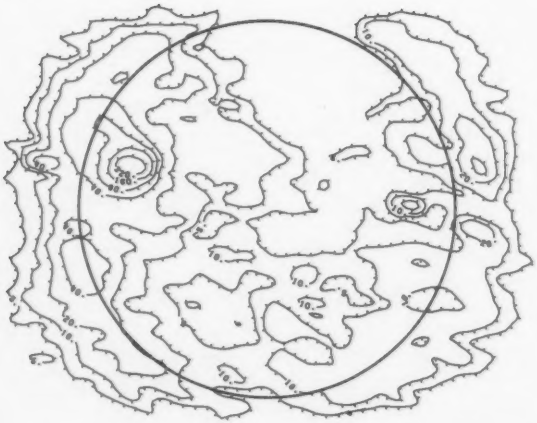
E

1630 UT

Np

NASA GSFC
OSO-7

FE XV
284A



E

W

COUNT = 17494
ROLL = 2.8°
P-TH = 6.71

1227 UT

Sp

Np

SUNSPOTS

W

CORONA

SAC PEAK

Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA

E

W

1501-1709 UT

Sp

Np

NRL
OSO-7

171-630A

E

W

1224 UT

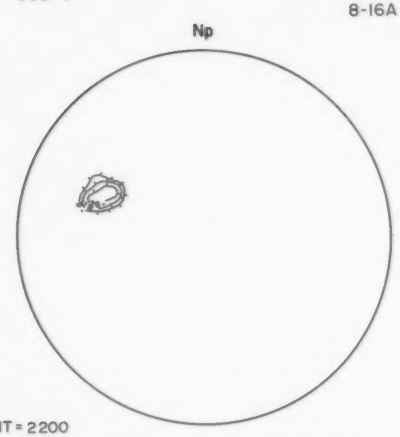
Sp

55
Nov 73

NOVEMBER 16, 1973 (P= 21.20, B_o = 2.7

NASA GSFC
OSO-7

X-RAY
8-16A

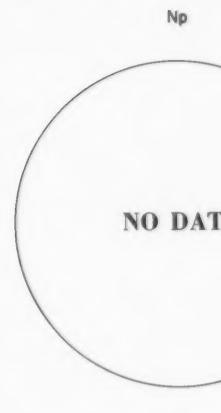


COUNT = 2200
ROLL = 2.5°
P-TH = 6.76

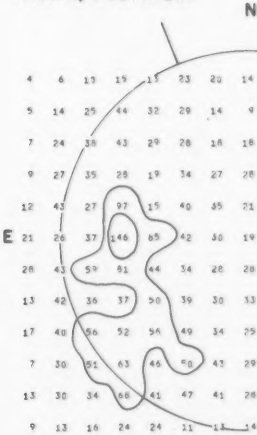
1248 UT

Counts per 0.125 sec.

PROSPECT HILL
AFCRL



FLEURS, AUSTRALIA



S

02-0

.70, L_o = 309.87)

MT. WILSON

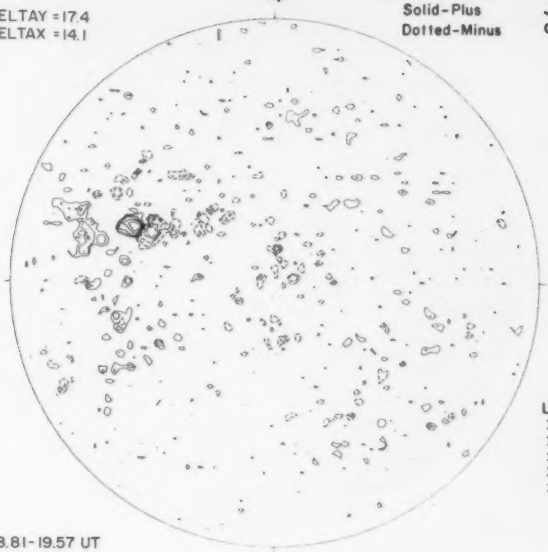
DELTAY = 17.4
DELTAX = 14.1

8.6 mm

ATA

W

Contours in Intervals of 200° K



MAGNETOGRAM
Solid-Plus
Dotted-Minus

Nov 73 56

Levels
±5
±10
±20
±40
±80

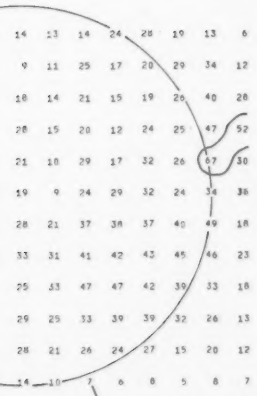
18.81-19.57 UT

21 cm

McMATH-HULBERT

CALCIUM REPORT

N

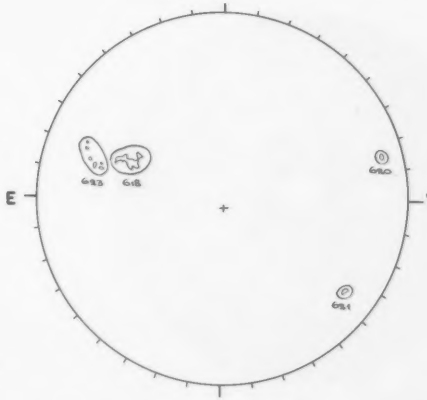


W

S

2-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K



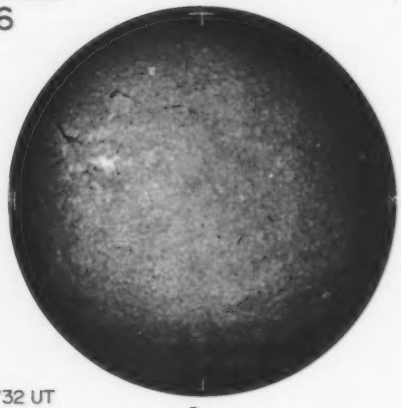
GOOD | S
18 - 1000 - 3.0

1932 UT

BOULDER
16

Np

Hα



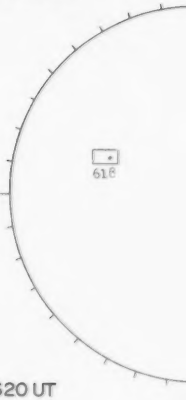
E

W

1732 UT

Sp

BOULDER



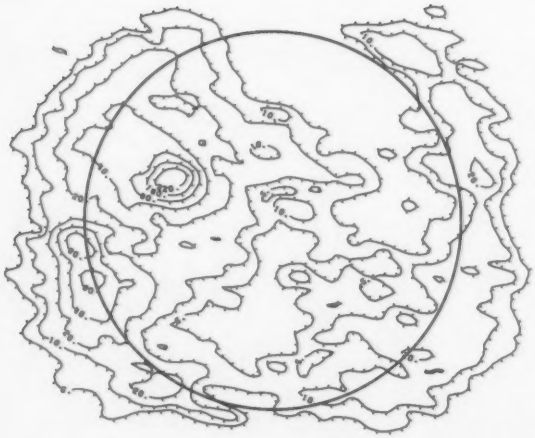
E

1620 UT

Np

NASA GSFC
OSO-7

FE XV
284A



E

W

COUNT = 17783
ROLL = 2.5°
P-TH = 6.76

1248 UT

Sp

Np

SUNSPOTS

W

CORONA

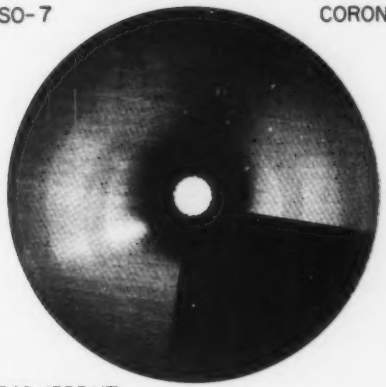
SAC PEAK

Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA



E

W

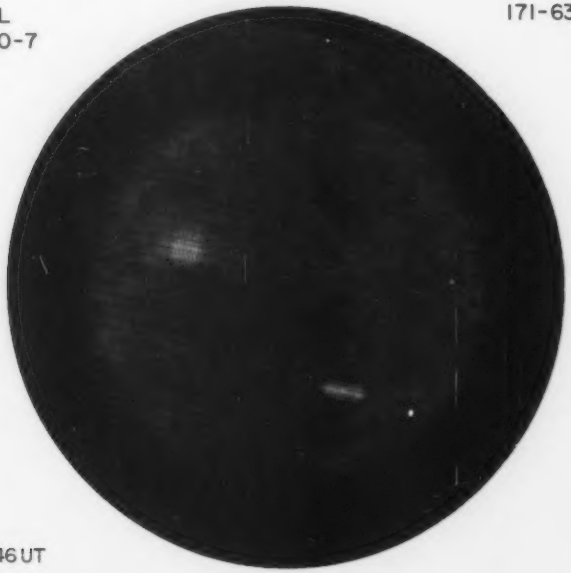
1346-1555 UT

Sp

Np

NRL
OSO-7

171-630A



E

W

1246 UT

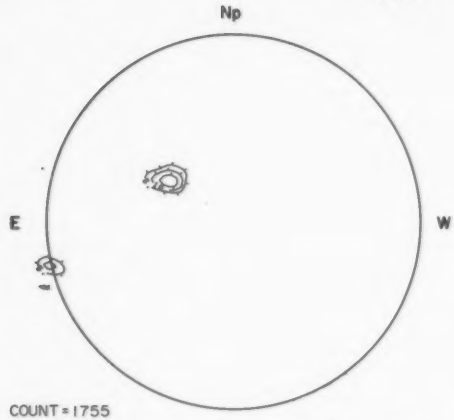
Sp

57
Nov 73

NOVEMBER 17, 1973 (P = 20.91, B_o = 2.58,

NASA GSFC
OSO-7

X-RAY
8-16A

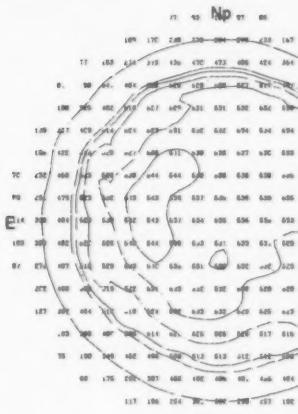


COUNT = 1755
ROLL = 2.9°
P-TH = 6.80

1134 UT

Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1631 UT

FLEURS, AUSTRALIA

N

E

NO DAT

S

02-03 UT

3, L_o = 296.69)

MT. WILSON

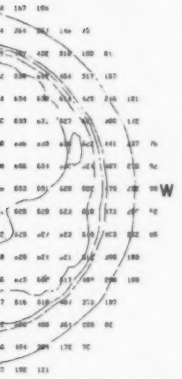
DELTAY =
DELT'''

Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus

58
Nov 73

8.6 mm



Contours in Intervals of 200° K

E

NO DATA

W

Levels
±5
±10
±20
±40
±80

Sp

21 cm

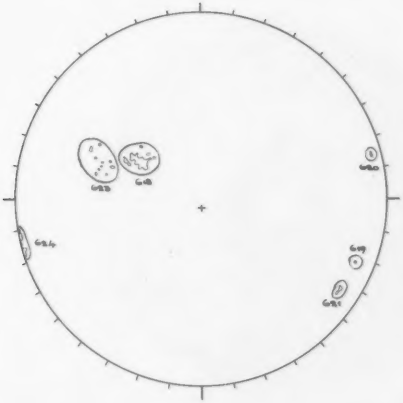
McMATH-HULBERT

CALCIUM REPORT

Np

ATA

W E



W

FAIR S
18 - 1000 - 3.0

Sp

3 UT

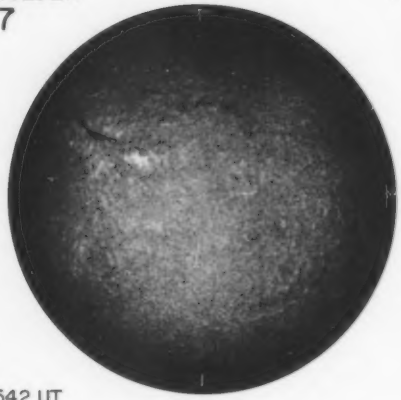
Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

1450 UT

BOULDER
17

Np

Hα



E

W

1542 UT

Sp

BOULDER

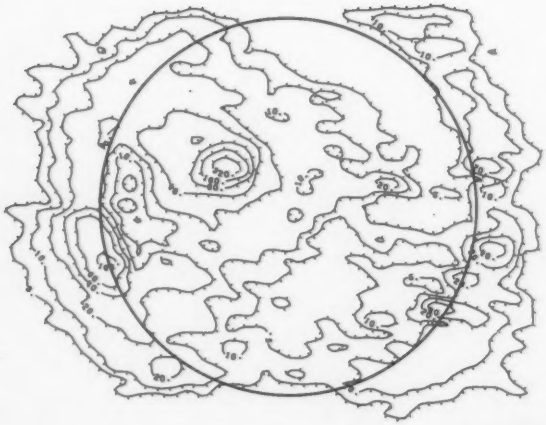
E

1745 UT

Np

NASA GSFC
OSO-7

FE XV
284A



E

W

COUNT = 18962
ROLL = 2.9°
P-TH = 6.80

1134 UT

Sp

Np

SUNSPOTS

W

CORONA

PIC DU MIDI

Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA

E

W

1409-1617 UT

Sp

Np

NRL
OSO-7

171-630A

E

W

1131 UT

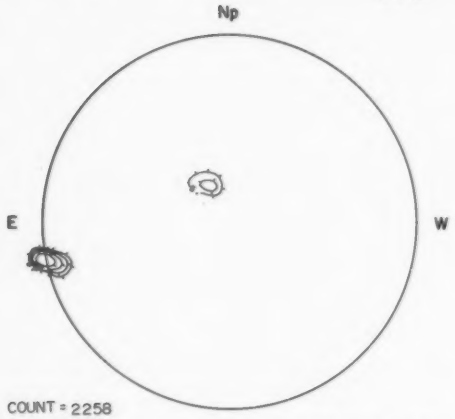
Sp

59
Nov 73

NOVEMBER 18, 1973 (P = 20.62, B_o = 2.46

NASA GSFC
OSO-7

X-RAY
8-16A

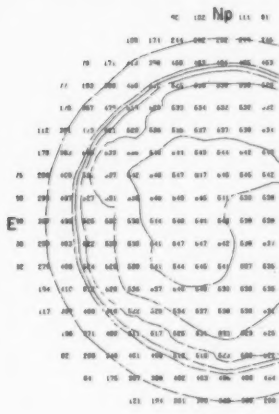


COUNT = 2258
ROLL = 3.6°
P-TH = 6.85

1156 UT

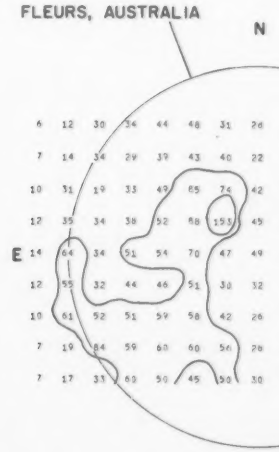
Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1612 UT

FLEURS, AUSTRALIA



02-03

46, L_o = 283.50)

MT. WILSON

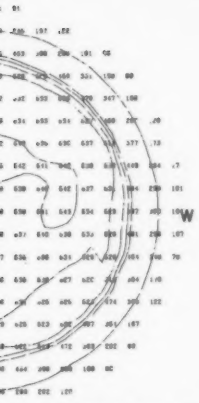
DELTAY =
DELTA

Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus

Nov 73 60

8.6 mm



E

W

NO DATA

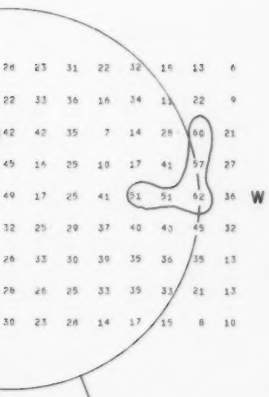
Levels
±5
±10
±20
±40
±80

Contours in Intervals
of 200° K

Sp

21 cm

N



W

S

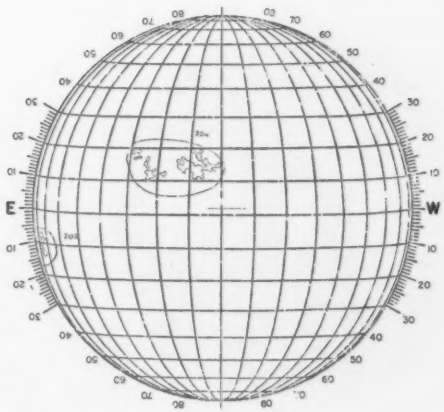
-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

CATANIA

Np

CALCIUM REPORT



E

W

FAIR EC
04 - 2667 ---

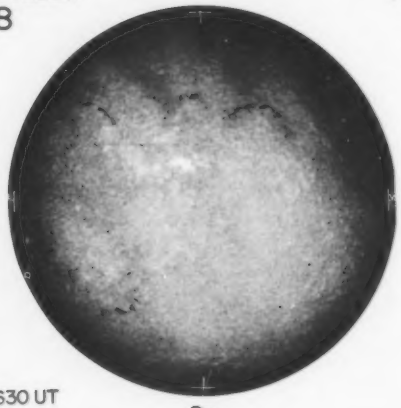
Sp

1015 UT

BOULDER
18

Np

Hα



E

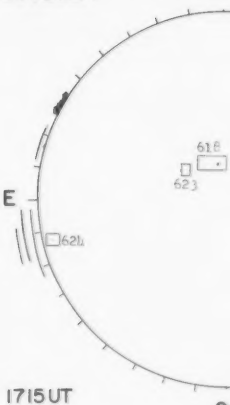
W

Sp

1630 UT

BOULDER

Np



E

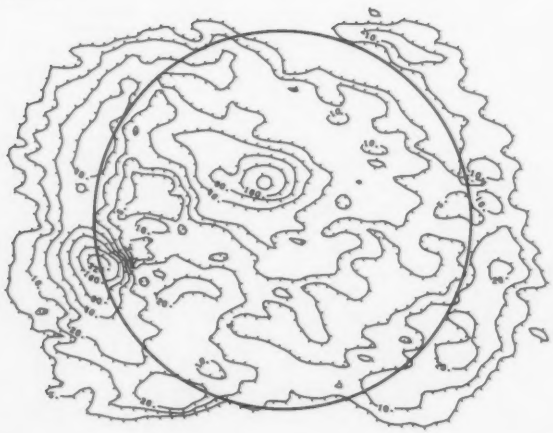
1715 UT

Sp

Np

NASA GSFC
OSO-7

FE XV
284A



E

W

COUNT = 20794
ROLL = 3.6°
P-TH = 6.85

1156 UT

Sp

Np

SUNSPOTS

W

CORONA

PIC DU MIDI

Sp

NRL

OSO-7

Np

WHITE-LIGHT

CORONA

E

W

1421-1639 UT

Sp

Np

NRL

OSO-7

171-630A

E

W

1152 UT

Sp

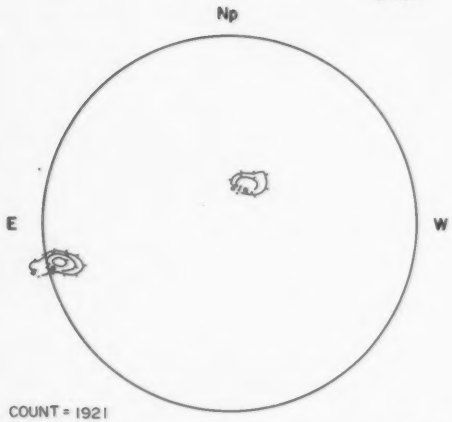
61

Nov 73

NOVEMBER 19, 1973 (P = 20.32, B_o = 2.3

NASA GSFC
OSO-7

X-RAY
8-16A

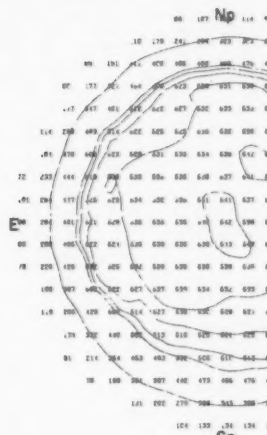


COUNT = 1921
ROLL = 4.2°
P-TH = 6.89

104 UT

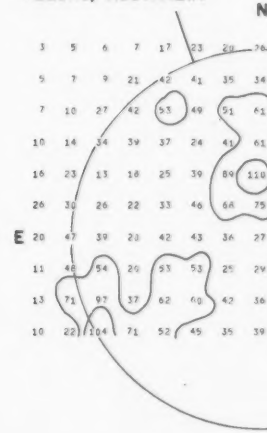
Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1634 UT

FLEURS, AUSTRALIA



S

02-0

2.34, L_o = 270.32)

MT. WILSON

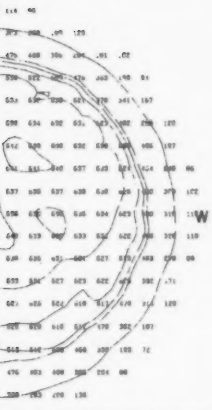
DELTAY =
DELT.

Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus

62
Nov 73

8.6 mm



E

W

NO DATA

Levels
±5
±10
±20
±40
±80

Contours in Intervals
of 200° K

UT

Sp

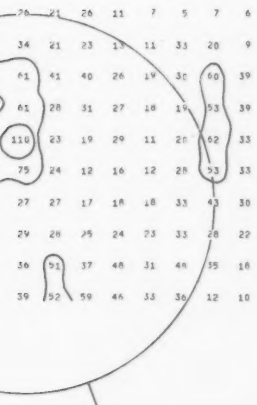
21 cm

CATANIA

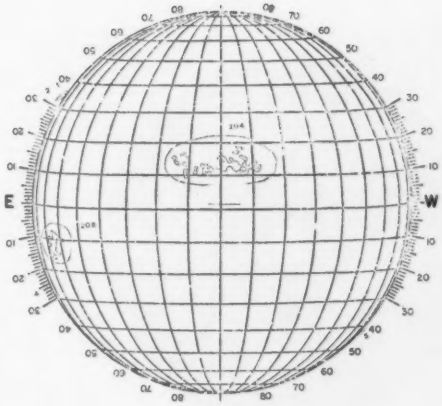
Np

CALCIUM REPORT

N



W



E

W

FAIR GD
04-2318 ---

S

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

2-03 UT

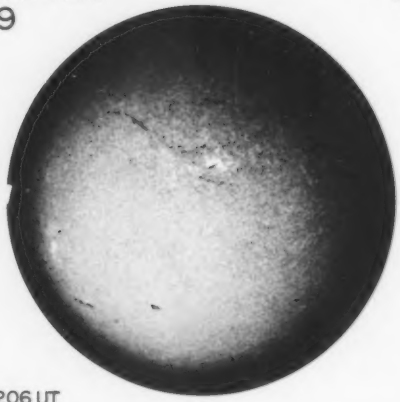
Sp

0937 UT

RAMEY AFB
19

Np

Hα



E

W

1206 UT

Sp

BOULDER

N

E

220

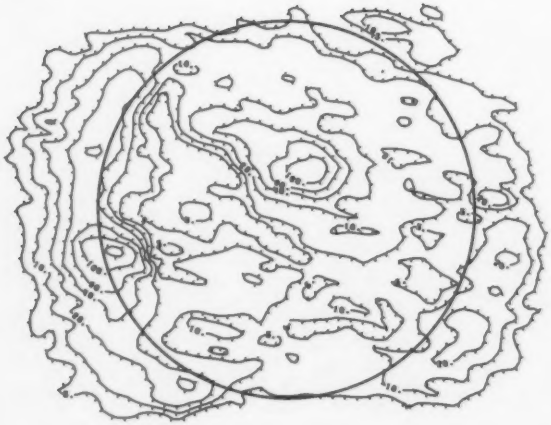
NO DATA

S

Np

NASA GSFC
OSO-7

FE XV
284A



E

W

COUNT = 21840
ROLL = 4.2°
P-TH = 6.89

1041 UT

Sp

Np

SUNSPOTS

W

CORONA

PIC DU MIDI

Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA

E

W

1453-1525 UT

Sp

Np

NRL
OSO-7

171-630A

E

W

1038 UT

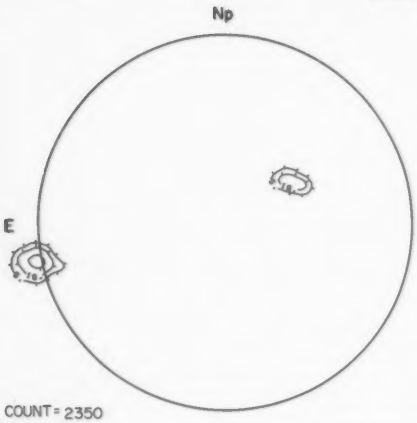
Sp

63
Nov 73

NOVEMBER 20, 1973 (P = 20.01, B_o = 2.22,

NASA GSFC
OSO-7

X-RAY
8-16A

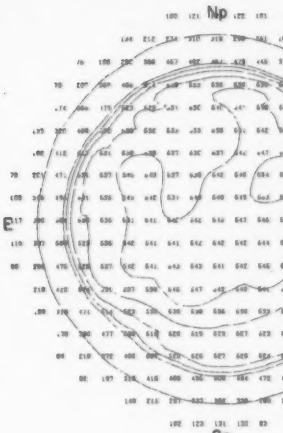


COUNT = 2350
ROLL = 4.1°
P-TH = 6.93

1104 UT

Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1520 UT

FLEURS, AUSTRALIA

N

E

NO DA

S

02-03

22, $L_o = 257.14$)

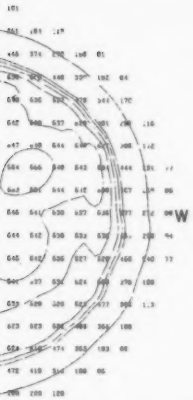
MT. WILSON

DELTAY = 17.6
DELTAX = 14.1

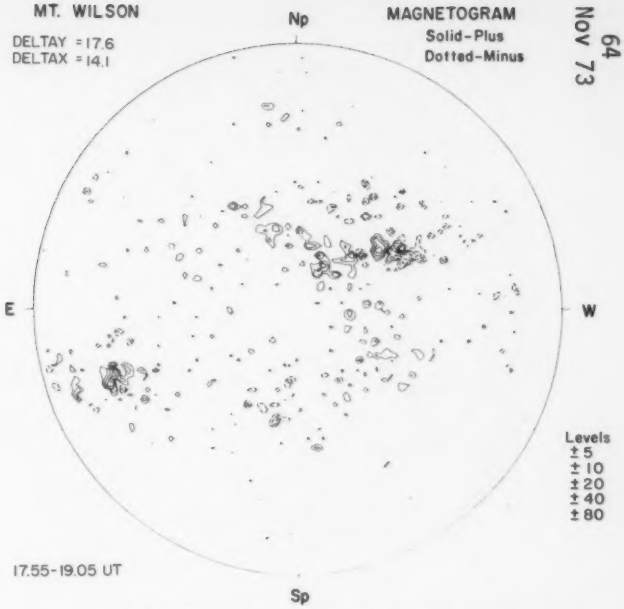
MAGNETOGRAM
Solid-Plus
Dotted-Minus

64
Nov 73

8.6 mm



Contours in Intervals of 200° K



Levels
± 5
± 10
± 20
± 40
± 80

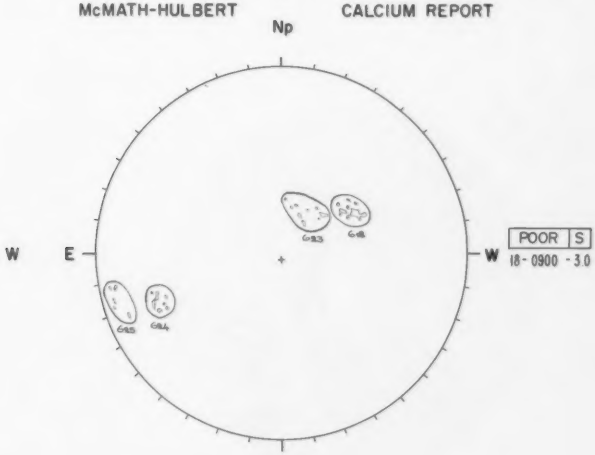
17.55-19.05 UT

21 cm

McMATH-HULBERT

CALCIUM REPORT

N



POOR	S
18-0900	-3.0

S
03 UT

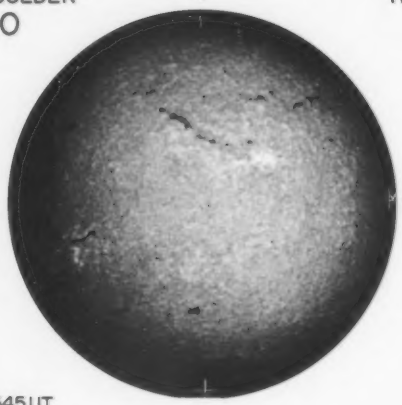
Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

1830 UT

BOULDER
20

Np

Hα



E

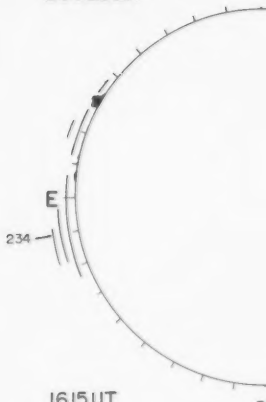
W

1545UT

Sp

BOULDER

N



E

234

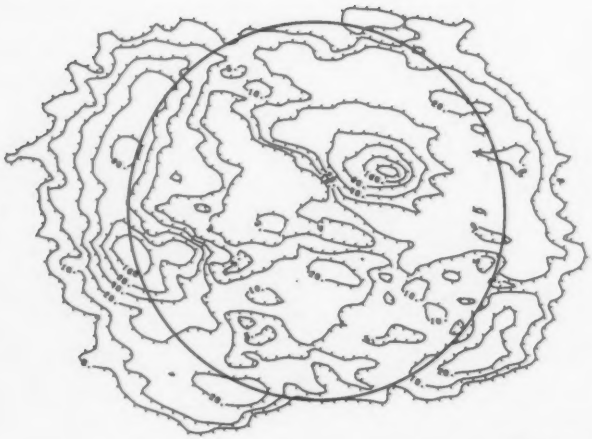
1615UT

S

Np

NASA GSFC
OSO-7

FE XV
284A



E

W

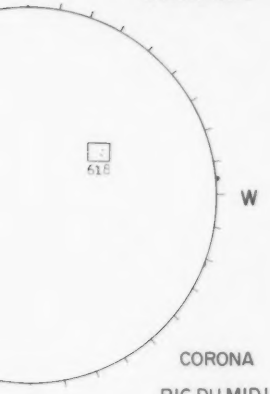
COUNT = 22156
ROLL = 4.1°
P-TH = 6.93

1104UT

Sp

Np

SUNSPOTS



CORONA

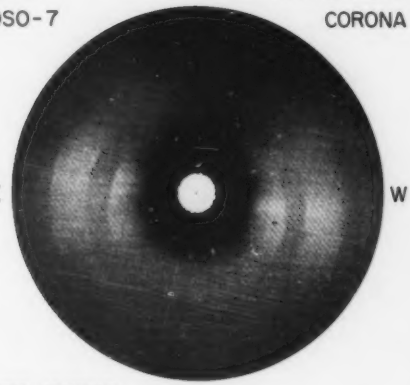
PIC DU MIDI

Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA



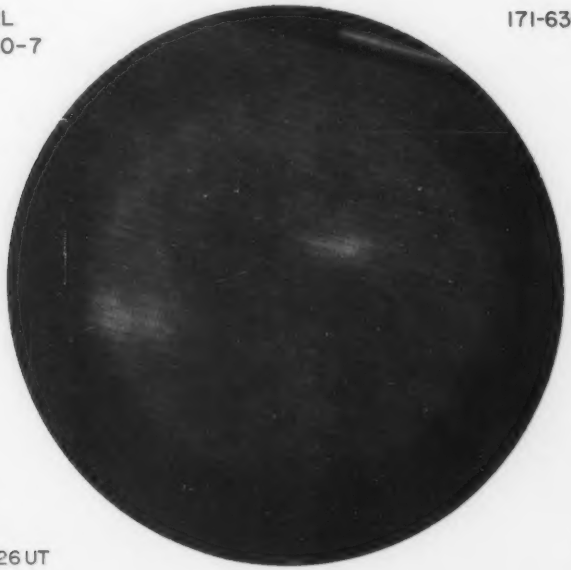
1338-1547 UT

Sp

Np

NRL
OSO-7

171-630A



0926 UT

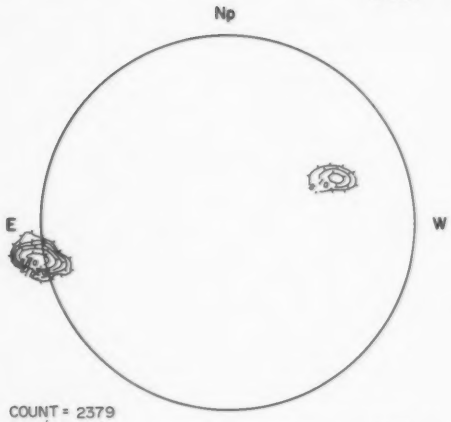
Sp

65
Nov 73

NOVEMBER 21, 1973 (P= 19.70, B_o= 2.10

NASA GSFC
OSO-7

X-RAY
8-16A

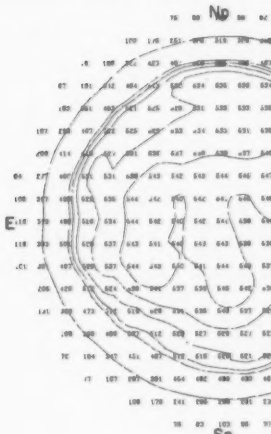


COUNT = 2379
ROLL = 4.0°
P-TH = 6.96

0949 UT

Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1517 UT

FLEURS, AUSTRALIA

N

E

NO D

S

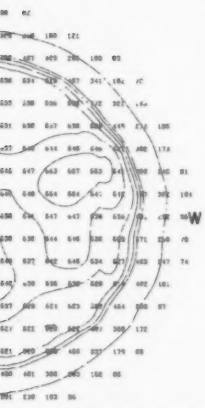
02-0

.10, L_o = 243.96)

MT. WILSON

DELTAY = 17.5
DELTAX = 14.1

8.6 mm



Contours in Intervals of 200° K

UT

21 cm

N

DATA

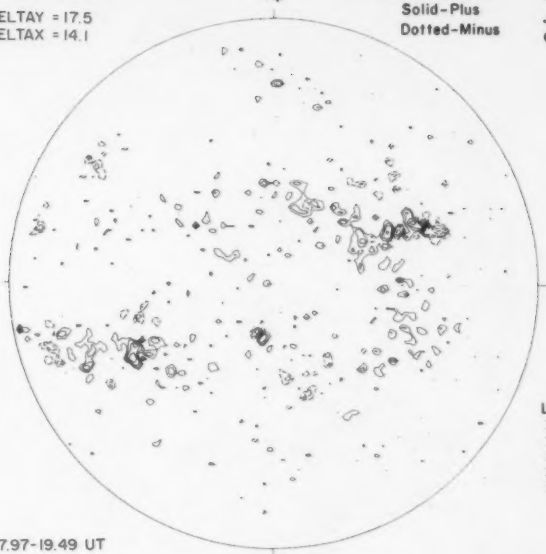
S

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

-03 UT

Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus



Levels
±5
±10
±20
±40
±80

17.97-19.49 UT

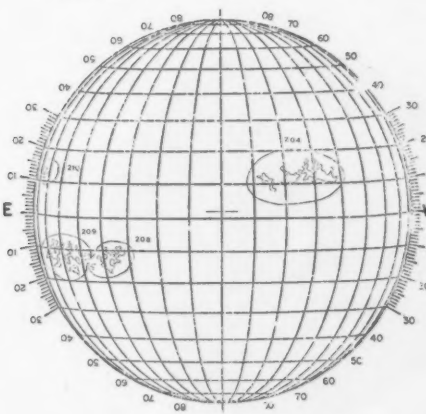
Sp

Nov 73 66

CATANIA

CALCIUM REPORT

Np



FAIR GD
04 - 2814---
09 - 3090---

Sp

0820 UT

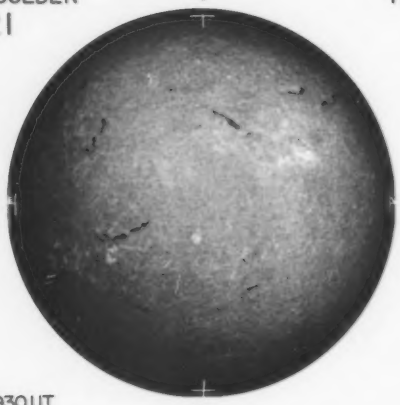
BOULDER
21

Np

Hα

E

W



1930 UT

Sp

BOULDER

E

1545 UT

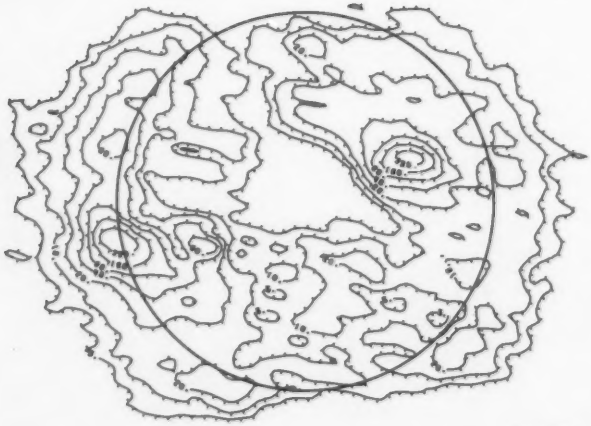
Np

NASA GSFC
OSO-7

FE XV
284A

E

W



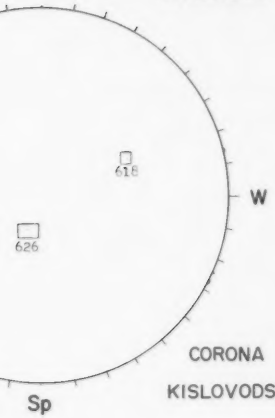
COUNT = 25298
ROLL = 4.0°
P-TH = 6.96

0949 UT

Sp

Np

SUNSPOTS



CORONA

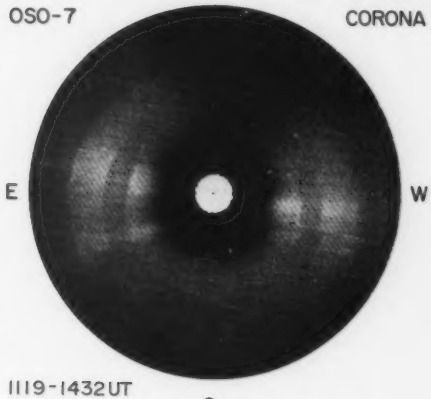
KISLOVODSK

Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA



1119-1432UT

Sp

Np

NRL
OSO-7

171-630A

E

NO DATA

W

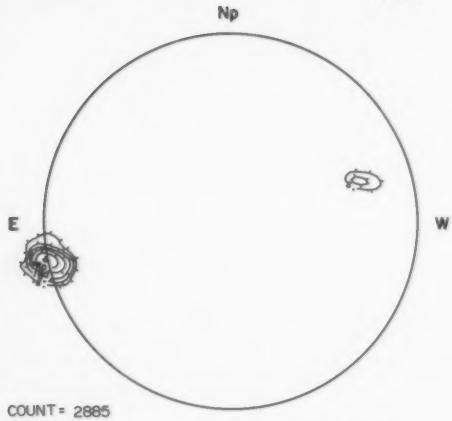
Sp

67
Nov 73

NOVEMBER 22, 1973 (P= 19.37, B_o= 1.98,

NASA GSFC
OSO-7

X-RAY
8-16A

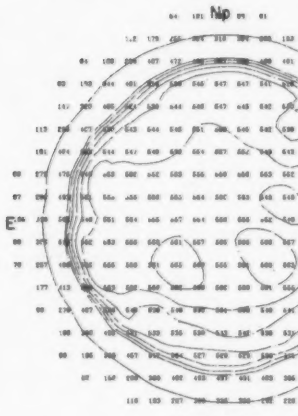


COUNT= 2885
ROLL = 4.0°
P-TH = 7.00

1011 UT

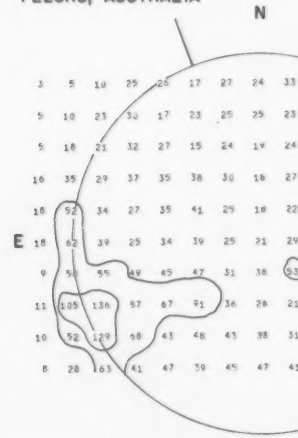
Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1946 UT

FLEURS, AUSTRALIA



02-03 U

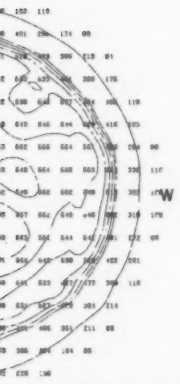
3, $L_o = 230.78$)

MT. WILSON

DELTAY =
DELTAX =

MAGNETOGRAM
Solid-Plus
Dotted-Minus

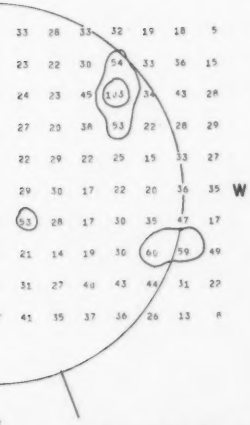
8.6 mm



Contours in Intervals
of 200° K

Levels
±5
±10
±20
±40
±80

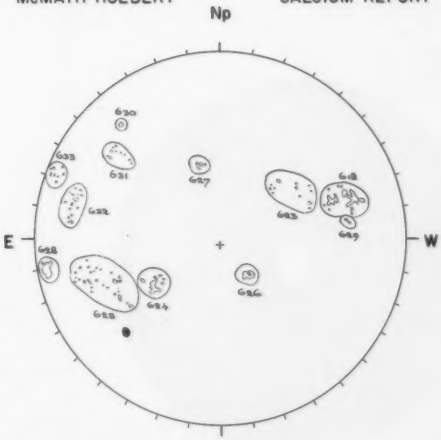
21 cm



3 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

McMATH-HULBERT CALCIUM REPORT



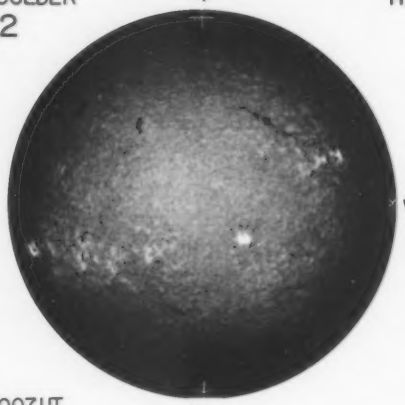
1615 UT

FAIR	M
18 - 1300	- 2.5
26 - 0400	- 3.0
28 - 1500	- 3.5

BOULDER
22

Np

Hα



E

W

2007UT

Sp

BOULDER

E

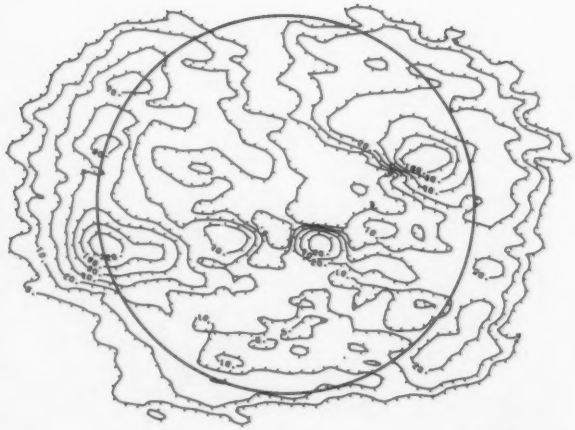
626

2045UT

Np

NASA GSFC
OSO-7

FE XV
284A



E

W

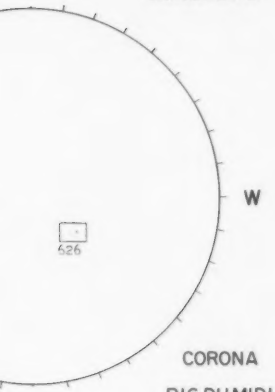
COUNT = 25191
ROLL = 4.0°
P-TH = 7.00

1011UT

Sp

Np

SUNSPOTS



CORONA

PIC DU MIDI

Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA

1140-1454UT

Sp

Np

NRL
OSO-7

171-630A

E

NO DATA

W

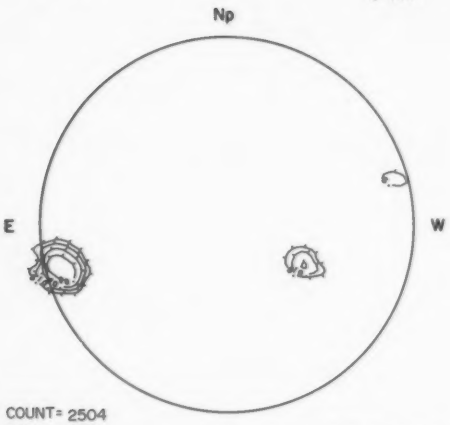
Sp

69
Nov 73

NOVEMBER 23, 1973 (P= 19.04, B_o= 1.85,

NASA GSFC
OSO-7

X-RAY
8-16A

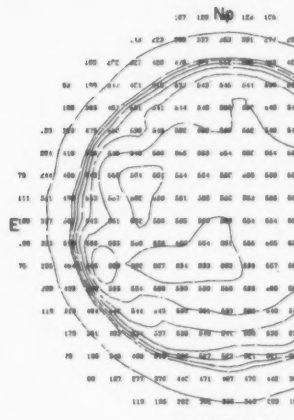


COUNT= 2504
ROLL = 4.3°
P-TH = 7.03

0856 UT

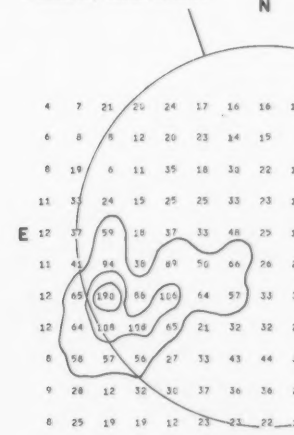
Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1936 UT

FLEURS, AUSTRALIA



02-03

5, L_o = 217.60)

MT. WILSON

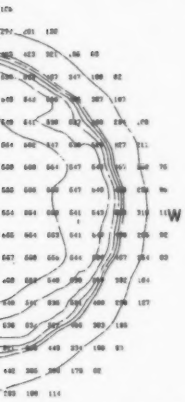
DELTAY =
DELTA

Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus

70 Nov 73

8.6 mm



E

W

Contours in Intervals of 200° K

NO DATA

Levels
±5
±10
±20
±40
±80

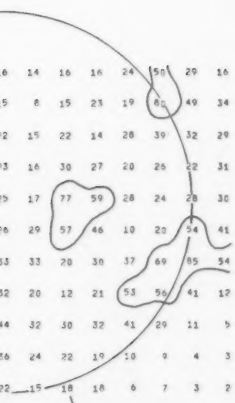
Sp

21 cm

McMATH-HULBERT

CALCIUM REPORT

Np

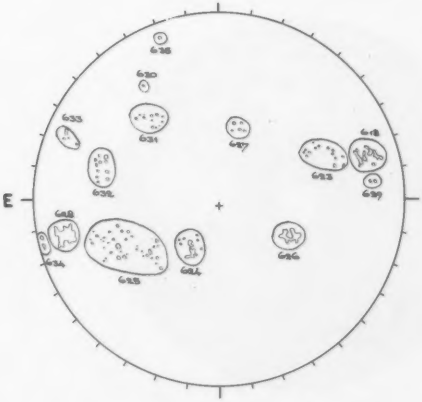


W

S

03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K



E

W

FAIR M
18 - 1200 - 2.5
26 - 0800 - 3.0
28 - 1800 - 3.5

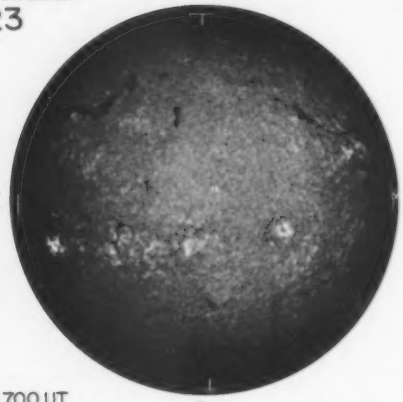
Sp

1500 UT

BOULDER
23

Np

Hα



E

W

1700 UT

Sp

BOULDER

N

E

628

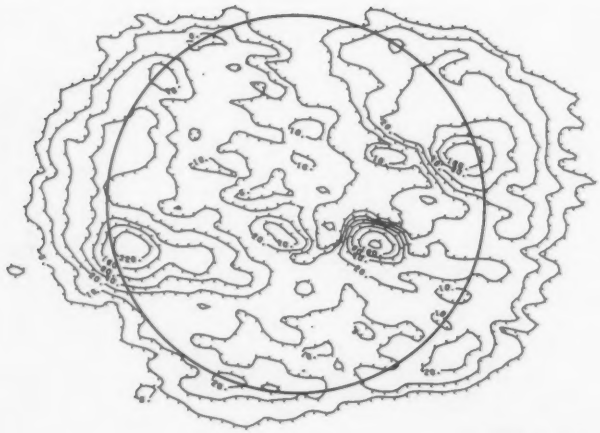
1700 UT

S

Np

NASA GSFC
OSO-7

FE XV
284A



E

W

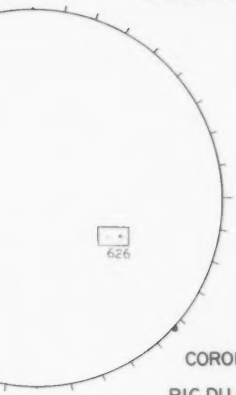
COUNT = 25881
ROLL = 4.3°
P-TH = 7.03

0856 UT

Sp

Np

SUNSPOTS



CORONA

PIC DU MIDI

Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA

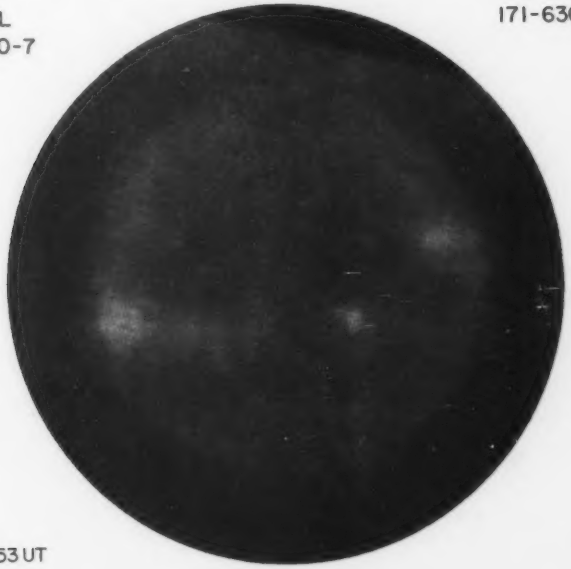
1202-1449 UT

Sp

Np

NRL
OSO-7

171-630A



0853 UT

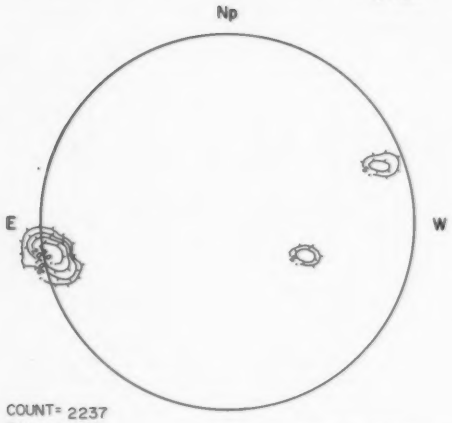
Sp

71
Nov 73

NOVEMBER 24, 1973 (P = 18.71, B_o = 1.73,

NASA GSFC
OSO-7

X-RAY
8-16A

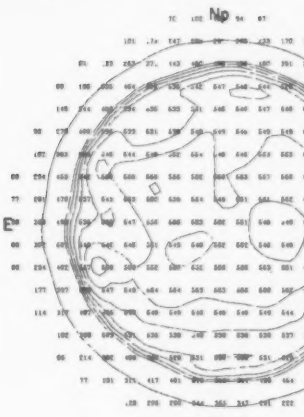


COUNT= 2237
ROLL = 4.3°
P-TH = 7.06

0742 UT

Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1606 UT

Co
of

FLEURS, AUSTRALIA

N

S

02-03 UT

3, L_o = 204.42)

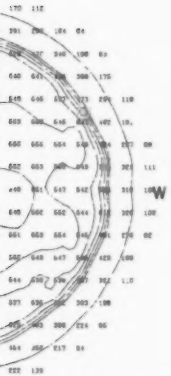
MT. WILSON

DELTAY =
DELTA''

Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus

8.6 mm



Contours in Intervals
of 200° K

E

NO DATA

W

Levels
± 5
± 10
± 20
± 40
± 80

Sp

21 cm

CATANIA

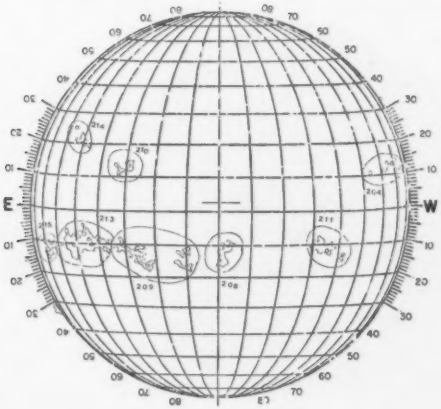
Np

CALCIUM REPORT

ATA

W

E



FAIR	GD
04 - 0781	---
11 - 1051	---
13 - 4286	---

Sp

UT

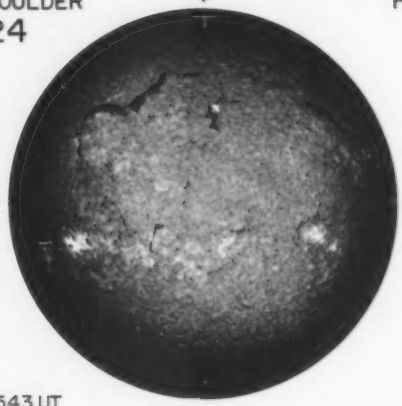
Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

0822 UT

BOULDER
24

Np

Hα



E

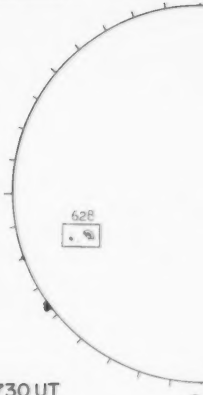
W

1543 UT

Sp

BOULDER

Np



E

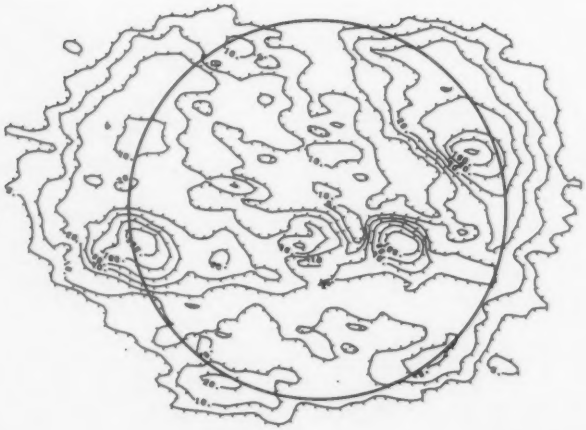
1730 UT

Sp

Np

NASA GSFC
OSO - 7

FE XV
284A



E

W

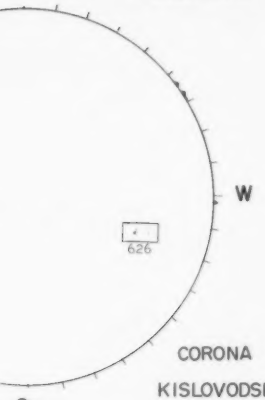
0742 UT

Sp

COUNT = 25650
ROLL = 4.3°
P-TH = 7.06

Np

SUNSPOTS



W

Sp

CORONA

KISLOVODSK

NRL
OSO-7

Np

WHITE-LIGHT
CORONA

E

NO DATA

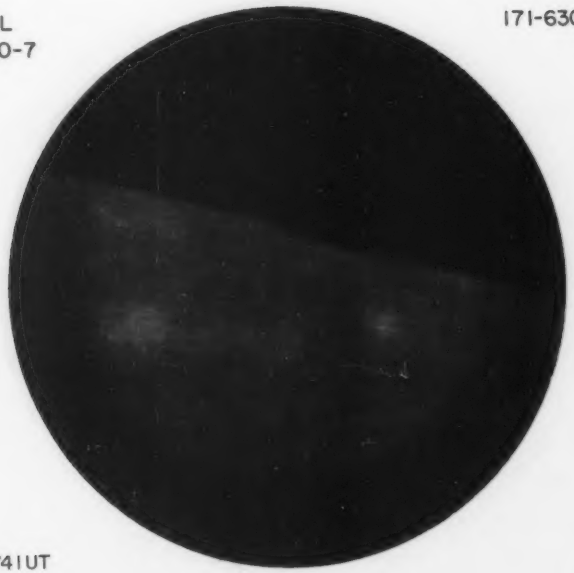
W

Sp

Np

NRL
OSO-7

171-630A



E

W

0741 UT

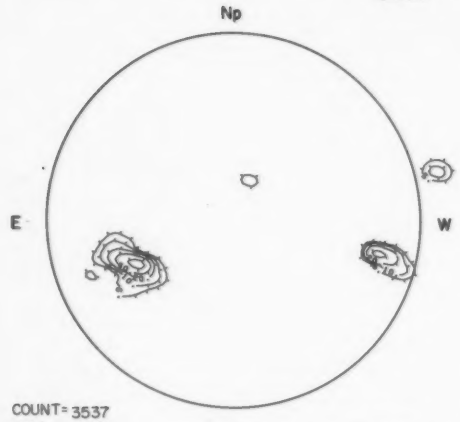
Sp

73
Nov 73

NOVEMBER 25, 1973 (P = 18.37, B_o = 1.6

NASA GSFC
OSO-7

X-RAY
8-16A

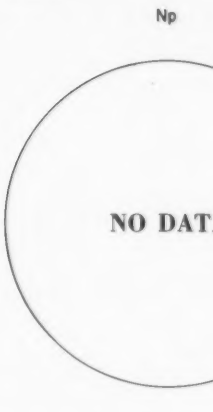


COUNT = 3537
ROLL = 4.3°
P-TH = 7.09

0940 UT

Counts per 0.125 sec.

PROSPECT HILL
AFCRL



FLEURS, AUSTRALIA

S
02-0

.61, L_o = 191.24)

MT. WILSON

DELTAY = 17.1
DELTAX = 14.1

8.6 mm

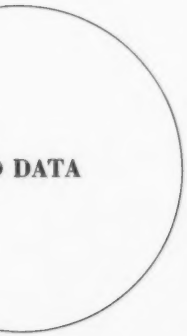
ATA

W

Contours in Intervals of 200° K

21 cm

N



DATA

W

S

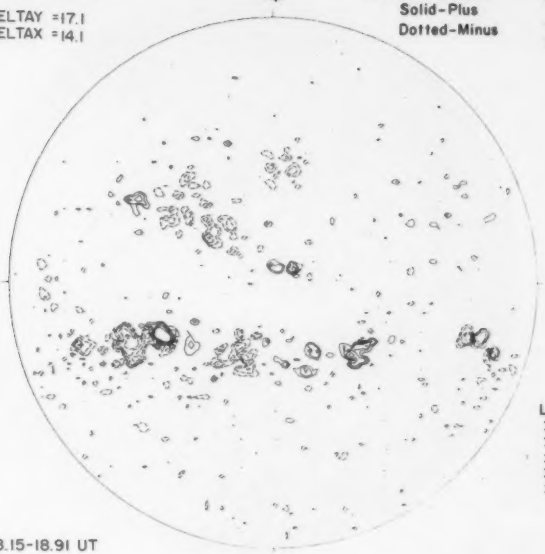
2-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus

74 Nov 73



E

W

Levels
±5
±10
±20
±40
±80

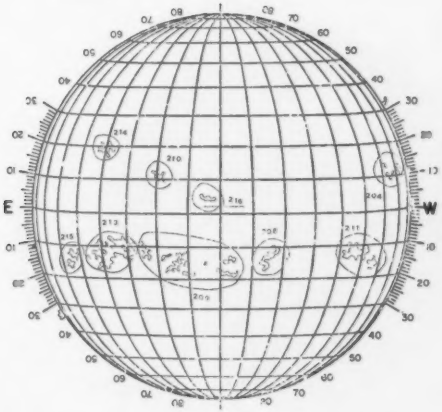
18.15-18.91 UT

Sp

CATANIA

Np

CALCIUM REPORT



W

E

W

GOOD	GD
04 - 1284	---
11 - 1955	---
08 - 0606	---
16 - 0227	---
09 - 1281	---
13 - 2545	---

Sp

0740 UT

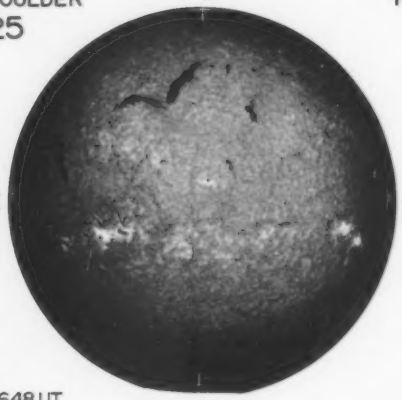
BOULDER
25

Np

Hα

E

W



1648 UT

Sp

BOULDER

N

E

628

1830 UT

S

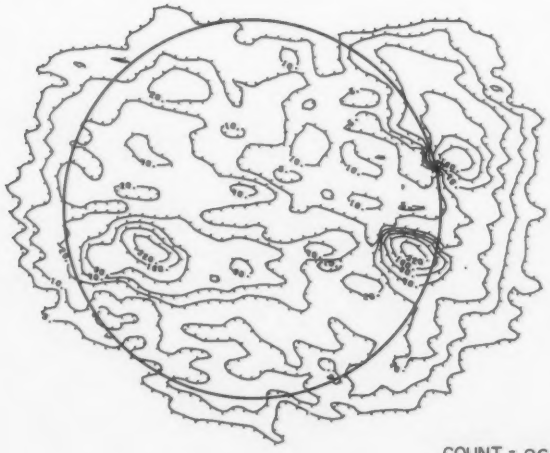
Np

NASA GSFC
OSO - 7

FE XV
284A

E

W



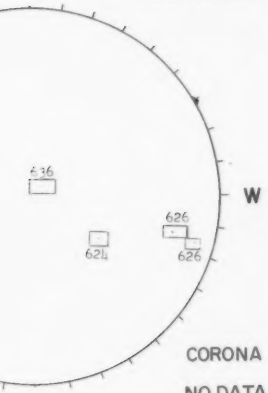
COUNT = 26005
ROLL = 4.3°
P-TH = 7.09

0940 UT

Sp

Np

SUNSPOTS



CORONA

NO DATA

Sp

NRL
OSO-7

Np

WHITE - LIGHT
CORONA

1108-1423UT

Sp

Np

NRL
OSO-7

171-630A

0800 UT

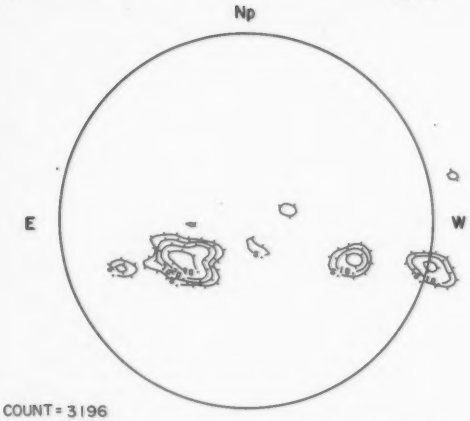
Sp

75
Nov 73

NOVEMBER 26, 1973 (P = 18.02, B_o = 1.48

NASA GSFC
OSO-7

X-RAY
8-16A



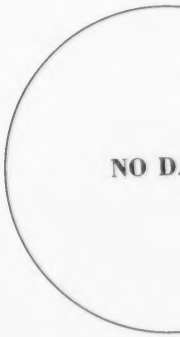
COUNT = 3196
ROLL = 4.1°
P-TH = 7.12

0825 UT

Counts per 0.125 sec.

PROSPECT HILL
AFCRL

FLEURS, AUSTRALIA



.48, L_o = 178.06) MT. WILSON

Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus

76 Nov 73

DELTAY =
DELTAX =

8.6 mm

E

W

Levels
± 5
± 10
± 20
± 40
± 80

Contours in Intervals
of 200° K

Sp

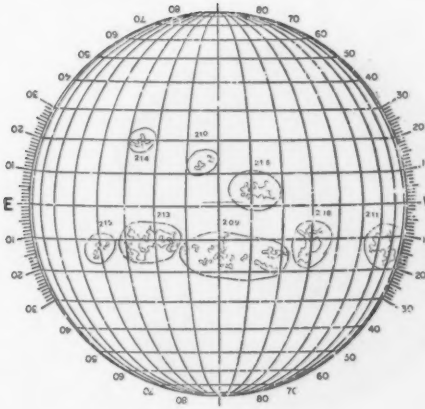
21 cm

CALCIUM REPORT

N

CATANIA

Np



GOOD	SS
11 - 3870	---
08 - 1798	---
16 - 1072	---
09 - 2205	---
13 - 3064	---

S

2-03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

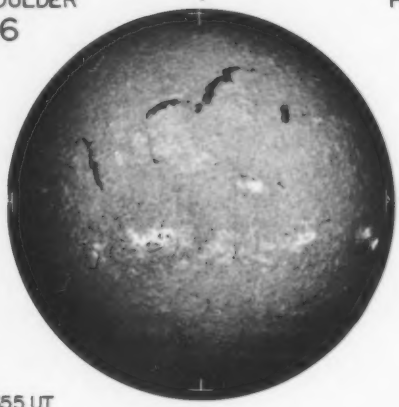
Sp

0910 UT

BOULDER
26

Np

Hα



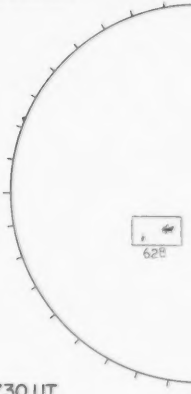
E

W

1655 UT

Sp

BOULDER



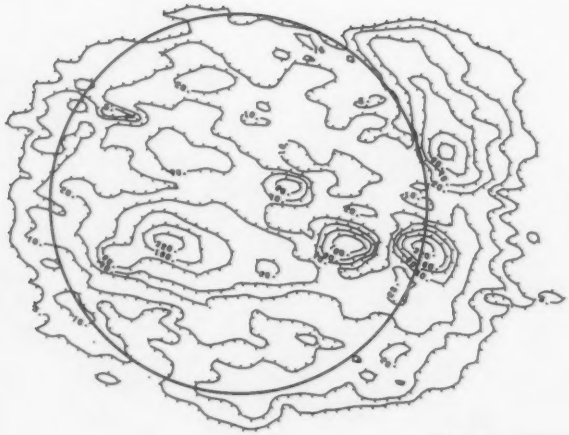
E

1730 UT

Np

NASA GSFC
OSO-7

FE XV
284A



E

W

COUNT = 27525
ROLL = 4.4°
P-TH = 7.12

0825 UT

Sp

Np

SUNSPOTS

CORONA

NORIKURA

Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA

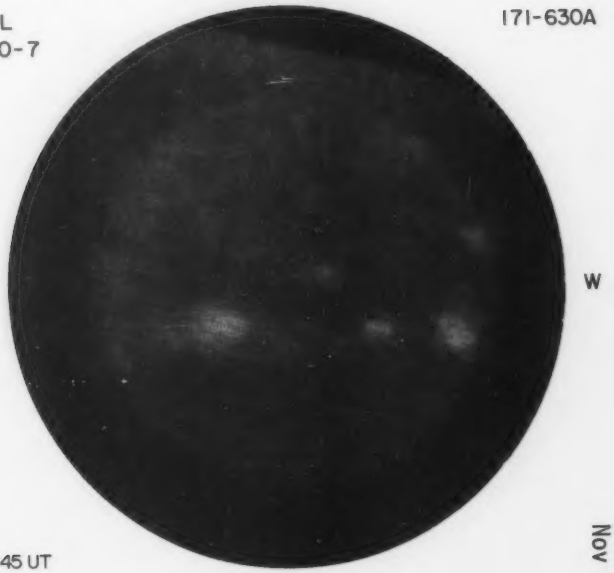
1131-1417 UT

Sp

Np

NRL
OSO-7

171-630A



0645 UT

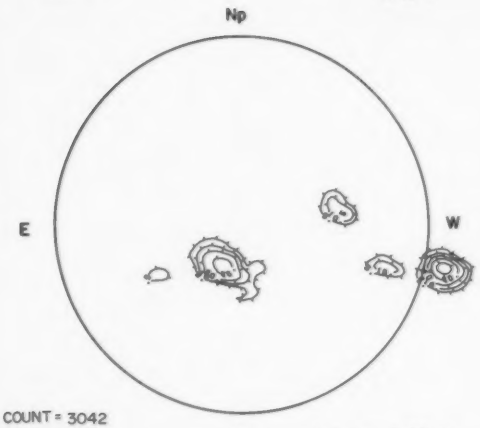
Sp

77
Nov 73

NOVEMBER 27, 1973 (P= 17.66, B_o= 1.36,

NASA GSFC
OSO-7

X-RAY
8-16A

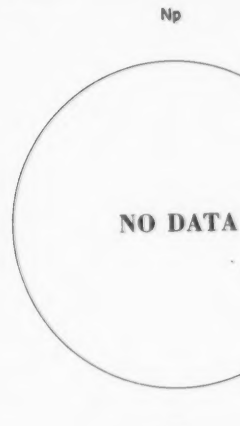


COUNT = 3042
ROLL = 4.4°
P-TH = 7.14

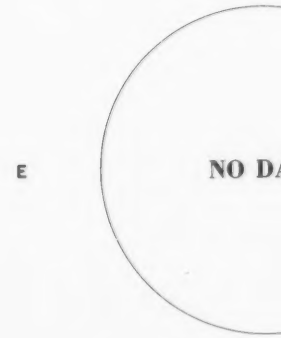
0710 UT

Counts per 0.125 sec.

PROSPECT HILL
AFCRL



FLEURS, AUSTRALIA



S

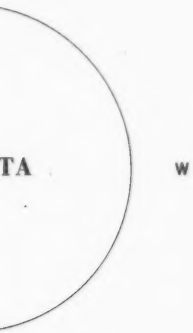
02-03

6, L_o = 164.88)

MT. WILSON

DELTAY = 17.2
DELTAX = 14.1

8.6 mm



TA

W

Contours in Intervals of 200° K

21 cm

N

DATA

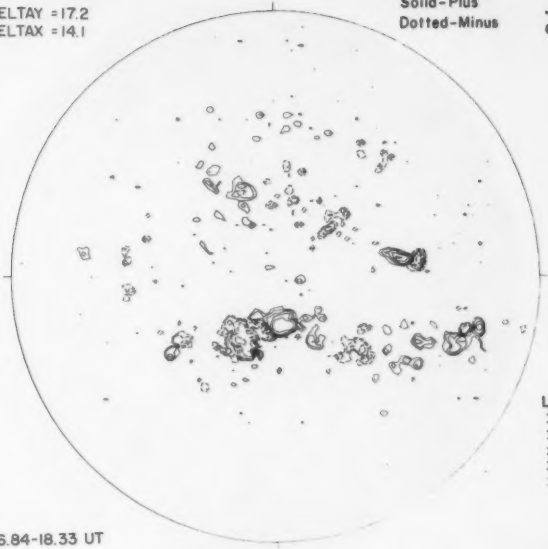
S

03 UT

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus



E

W

Levels
±5
±10
±20
±40
±80

16.84-18.33 UT

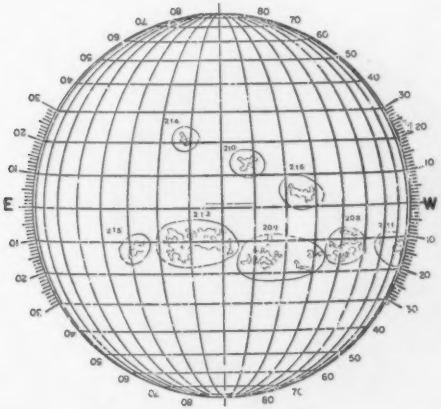
Sp

78 Nov 73

CATANIA

CALCIUM REPORT

Np



W

E

GOOD	GD
11-1617	---
08-1960	---
16-0938	---
09-1702	---
13-4091	---

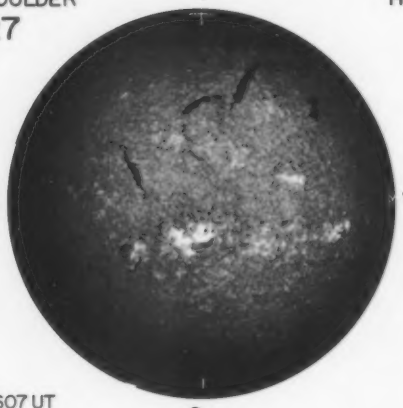
Sp

0820 UT

BOULDER
27

Np

Hα



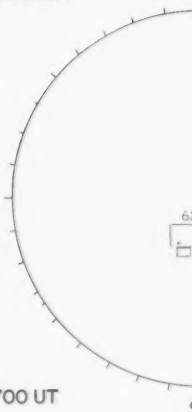
E

W

Sp

1607 UT

BOULDER



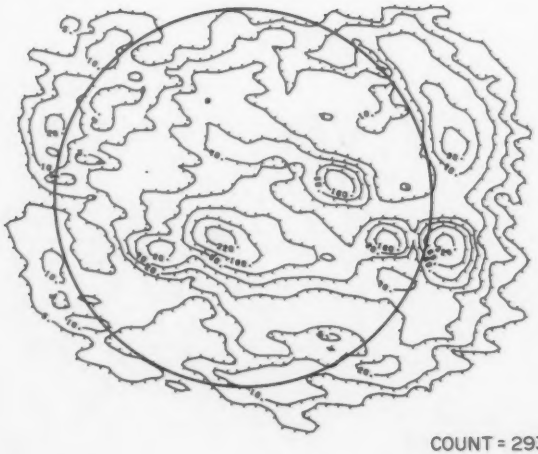
E

1700 UT

Np

NASA GSFC
OSO-7

FE XV
284A



E

W

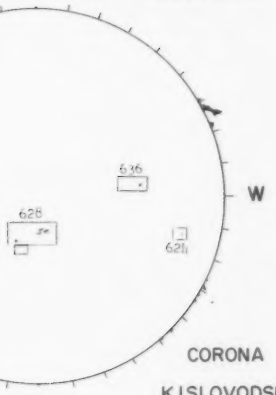
COUNT = 29315
ROLL = 4.4°
P-TH = 7.14

0710 UT

Sp

Np

SUNSPOTS



CORONA

KISLOVODSK

Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA

1152 - 1506 UT

Sp

Np

NRL
OSO-7

171-630A

0706 UT

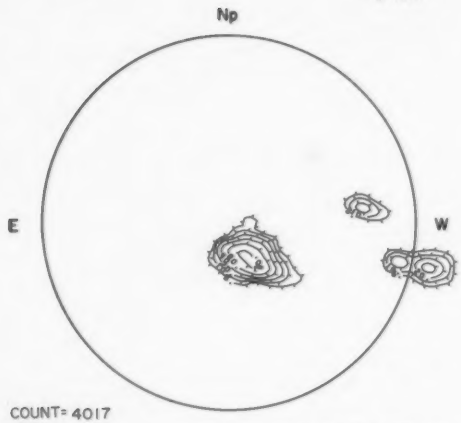
Sp

79
Nov 73

NOVEMBER 28, 1973 (P= 17.30, B_o = 1.23,

NASA GSFC
OSO-7

X-RAY
8-16A



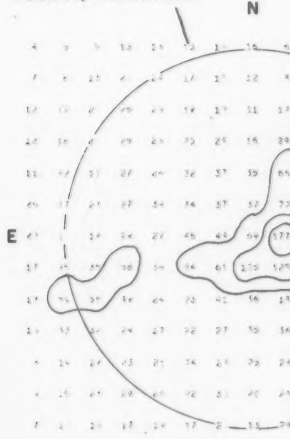
COUNT= 4017
ROLL = 4.4°
P-TH = 7.16

073 UT

Counts per 0.125 sec.

PROSPECT HILL
AFCRL

FLEURS, AUSTRALIA



02-03 U

3, L_o = 151.70)

MT. WILSON

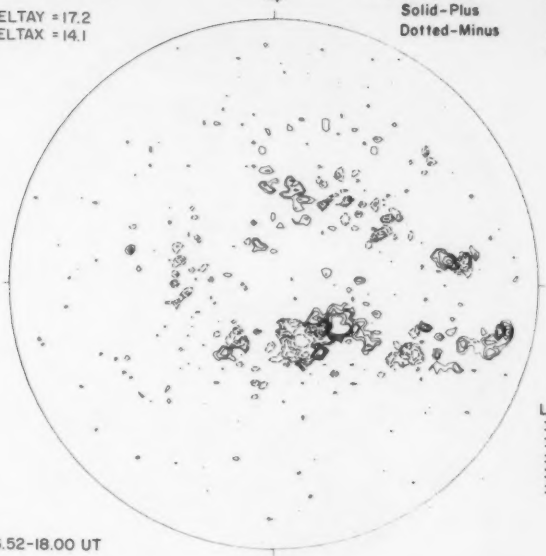
DELTAY = 17.2
DELTAX = 14.1

8.6 mm

A

W

Contours in Intervals of 200° K



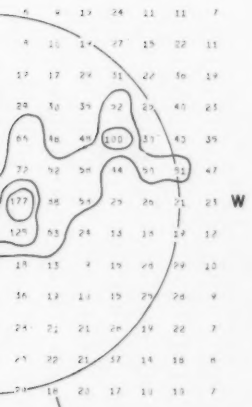
MAGNETOGRAM
Solid-Plus
Dotted-Minus

Nov 73 80

Levels
±5
±10
±20
±40
±80

16.52-18.00 UT

21 cm



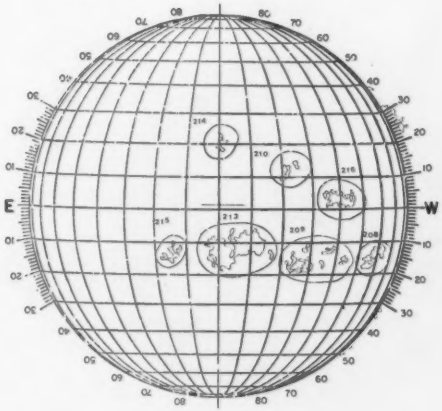
W

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

3 UT

CATANIA

CALCIUM REPORT



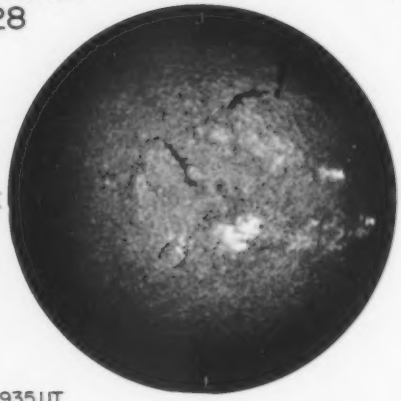
GOOD	GD
08 - 1947	---
16 - 1849	---
09 - 1787	---
13 - 2338	---

0810 UT

BOULDER
28

Np

Hα



E

W

1935 UT

Sp

BOULDER

N

E

1815 UT

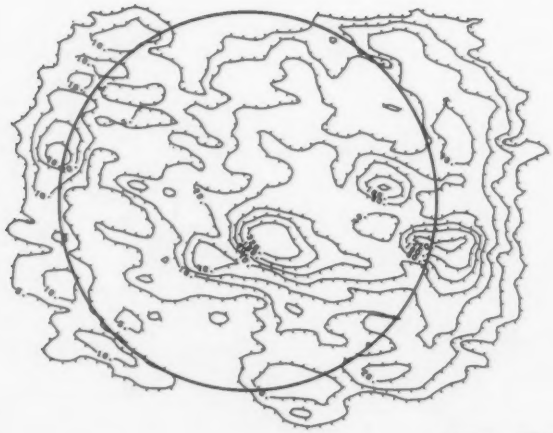
S

Np

NASA GSFC
OSO-7

FE XV
284A

E



W

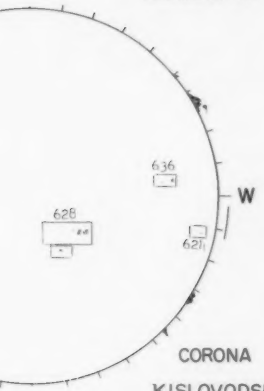
COUNT = 30133
ROLL = 4.4°
P-TH = 7.16

0731 UT

Sp

Np

SUNSPOTS



CORONA

KISLOVODSK

Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA

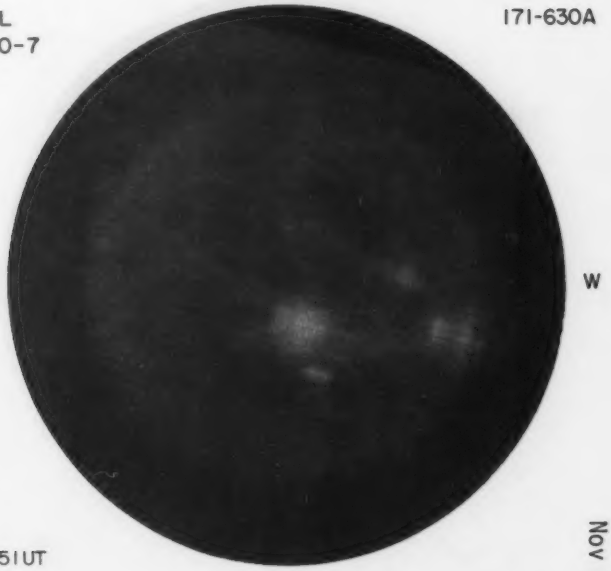
0901-1358UT

Sp

Np

NRL
OSO-7

171-630A



0551UT

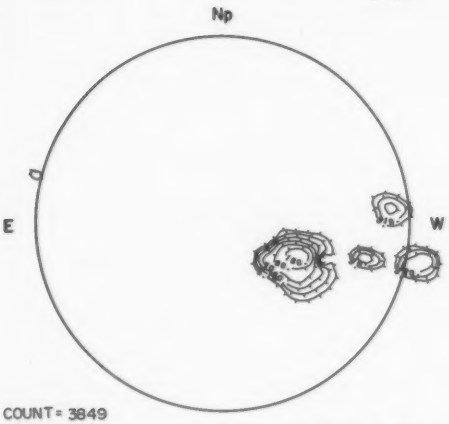
Sp

81
Nov 73

NOVEMBER 29, 1973 (P= 16.93, B_o = 1.10,

NASA GSFC
OSO-7

X-RAY
8-16A

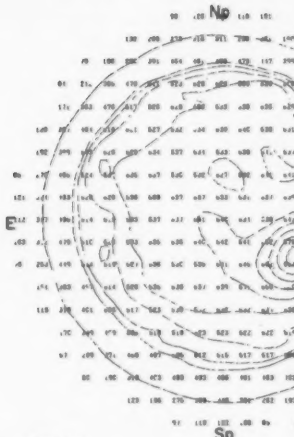


COUNT = 3849
ROLL = 5.1°
P-TH = 7.18

0749 UT

Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1543 UT

FLEURS, AUSTRALIA

02-03 U

0, L_o = 138.52)

MT. WILSON

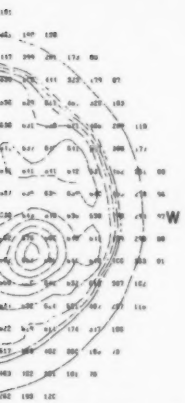
DELTAY =
DELTA

Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus

82
Nov 73

8.6 mm



E

W

NO DATA

E

W

Levels
±5
±10
±20
±40
±80

Contours in Intervals
of 200° K

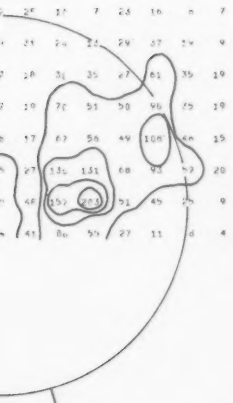
Sp

21 cm

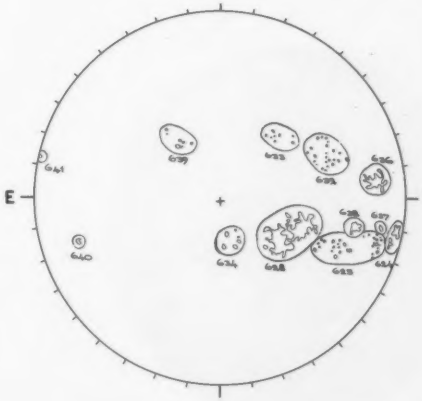
McMATH-HULBERT

CALCIUM REPORT

Np



W



E

W

FAIR	M
24 - 1400	- 3.0
28 - 4000	- 3.5
36 - 1500	- 3.0
38 - 0800	- 2.5

Sp

03 UT

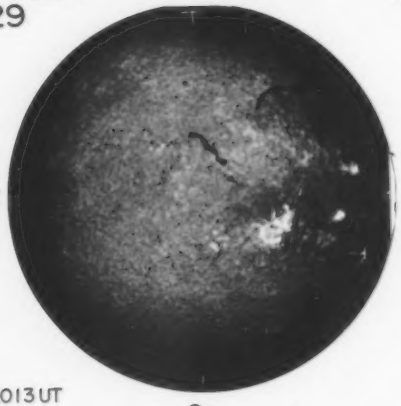
Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

1535 UT

BOULDER
29

Np

Hα



E

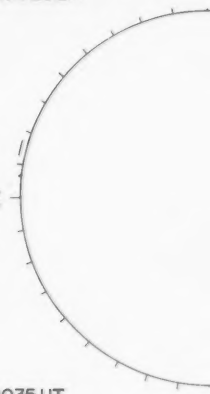
W

2013 UT

Sp

BOULDER

N



E

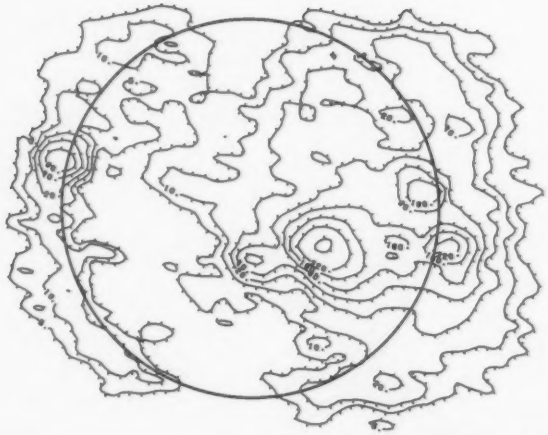
2035 UT

S

Np

NASA GSFC
OSO-7

FE XV
284A



E

W

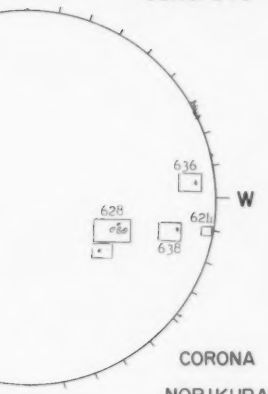
COUNT = 30329
ROLL = 5.1°
P-TH = 7.18

0749 UT

Sp

Np

SUNSPOTS



CORONA

NORIKURA

Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA

0922-1413UT

Sp

Np

NRL
OSO-7

171-630A

E

NO DATA

W

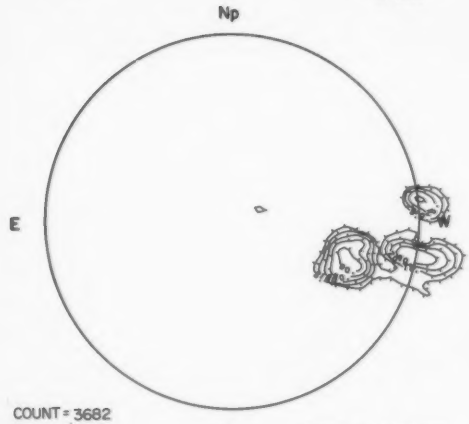
Sp

83
Nov 73

NOVEMBER 30, 1973 (P= 16.55, B_o = 0.98

NASA GSFC
OSO-7

X-RAY
8-16A

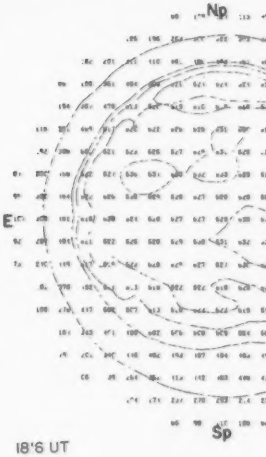


COUNT = 3682
ROLL = 6.2°
P-TH = 7.20

0637 UT

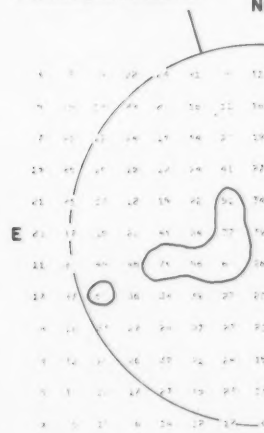
Counts per 0.125 sec.

PROSPECT HILL
AFCRL



1816 UT

FLEURS, AUSTRALIA



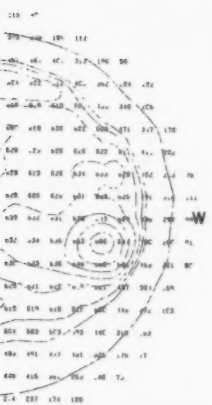
02-0

0.98, L_o = 125.34)

MT. WILSON

DELTAY =
DELTAY -

8.6 mm



E

W

Contours in Intervals of 200° K

Np

MAGNETOGRAM
Solid-Plus
Dotted-Minus

84 Nov 73

NO DATA

Levels
±5
±10
±20
±40
±80

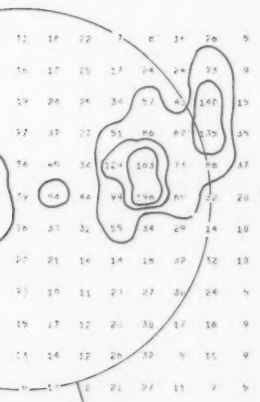
Sp

21 cm

McMATH-HULBERT

CALCIUM REPORT

N



W

S

Resolution 3 Minutes of Arc
Brightness Unit 1,700° K

2-03 UT

Np

E

W

FAIR	M
28 - 3700	- 3.5
36 - 1400	- 3.0
38 - 1000	- 3.0
41 - 0300	- 2.5

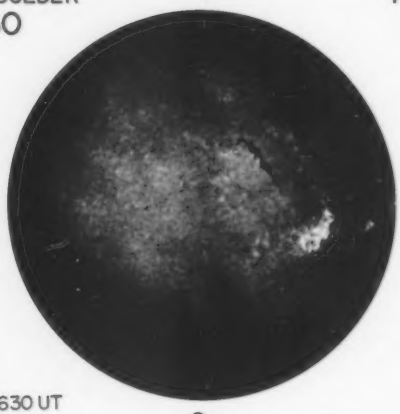
Sp

1500 UT

BOULDER
30

Np

Hα



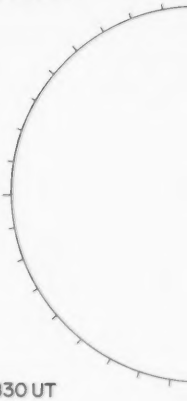
E

W

1630 UT

Sp

BOULDER



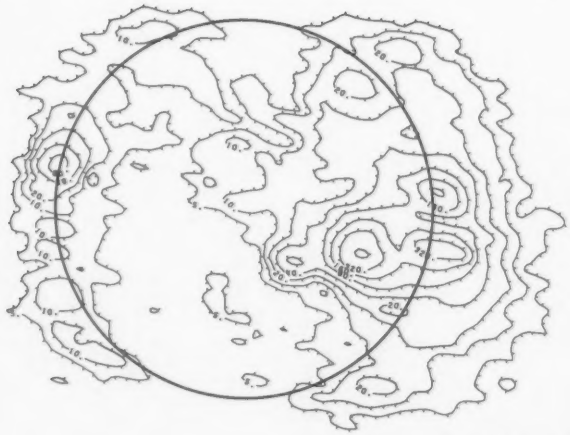
E

1830 UT

Np

NASA GSFC
OSO-7

FE XV
284A



E

W

COUNT = 29007
ROLL = 6.2°
P-TH = 7.20

0637 UT

Sp

Np

SUNSPOTS

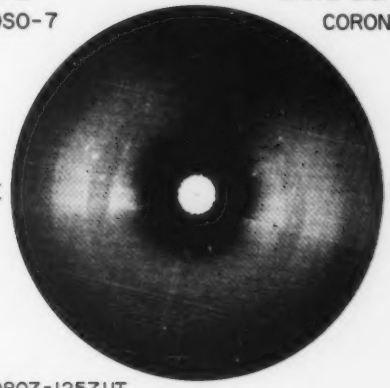
CORONA
NO DATA

Sp

NRL
OSO-7

Np

WHITE-LIGHT
CORONA



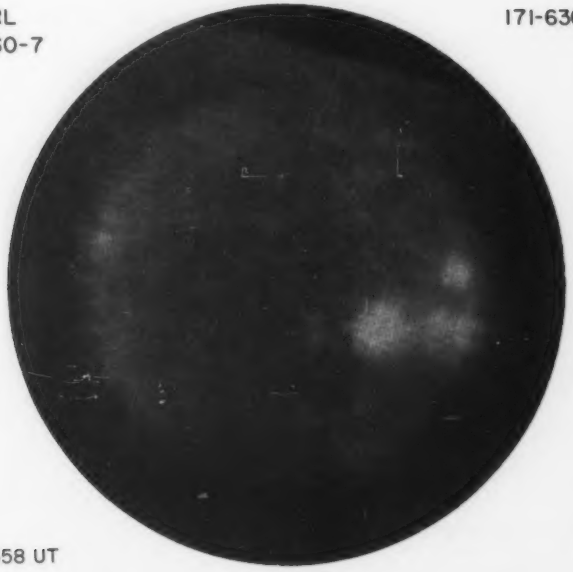
0807-1257 UT

Sp

Np

NRL
OSO-7

171-630A



0458 UT

Sp

85
Nov 73

REGIONS OF SOLAR ACTIVITY

NOVEMBER 1973

MCMATH REGION 12602 CMP DATE 2.1

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA							9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	5	12602	N19 W47	133	100	2.0										
73	11	6	12602	N20 W60	134	100	2.5										

MCMATH REGION 12603 CMP DATE 3.3

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA							9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	6	12603	S16 W43	117	200	1.5										

MCMATH REGION 12606 CMP DATE 3.4

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA							9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	7	12606	N14 W55	115	100	2.0										

MCMATH REGION 12599 CMP DATE 3.6

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA							9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	4	12599	N15 W13	112	200	1.5										

MCMATH REGION 12594 CMP DATE 3.7

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA							9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	10	28						19284	N04 E76	116	AP		B	10	3	BXO	
73	10	29						19284	N04 E63	116	(AP)	3	B	10	2	AXX	
73	10	30						19284	N03 E50	115	(AP)	3	B	10	1	AXX	
73	10	31						19284	N02 E37	113	(BP	2	R	10	1	HRX	
73	11	1	12594	N04 E27	112	1000	3.5										
73	11	2	12594	N04 E13	112	1000	3.0										
73	11	3	12594	N04 E00	113	900	3.5										
73	11	4	12594	N04 W13	112	800	2.5										
73	11	5	12594	N04 W26	112	800	2.5										
73	11	6	12594	N04 W40	114	800	3.0										
73	11	7	12594	N04 W53	113	800	3.0										
73	11	8	12594	N04 W67	112	800	2.0										
73	11	9	12594	N04 W80	113	300	1.0										

MCMATH REGION 12596 CMP DATE 5.1

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA							9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	4	12596	N10 E06	93	100	1.0										

MCMATH REGION 12612 CMP DATE 5.7

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA							9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	10	12612	N31 W68	89	100	1.5										

MCMATH REGION 12597 CMP DATE 7.0

				CALCIUM	PLAGE	DATA			SUNSPOT	DATA							9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	4	12597	S36 E32	67	100	1.0										

The new column marked STA is inserted to indicate the source of data for sunspot area, count and classification.
B = Boulder C = Carnarvon G = Gran Canaria (Canary Islands) M = Manila R = Ramey

REGIONS OF SOLAR ACTIVITY

NOVEMBER 1973

MCMATH REGION 12601 CMP DATE 7.1

				CALCIUM PLAGE DATA				SUNSPOT DATA							9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS INT FLUX
73	11	4	12601	N14 E33	66	100	1.0								
73	11	5	12601	N14 E20	66	100	1.0								

MCMATH REGION 12600 CMP DATE 7.1

				CALCIUM PLAGE DATA				SUNSPOT DATA							9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS INT FLUX
73	11	5	12600	N20 E19	67	100	1.0								

MCMATH REGION 12613 CMP DATE 7.1

				CALCIUM PLAGE DATA				SUNSPOT DATA							9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS INT FLUX
73	11	10	12613	S30 W50	67	200	2.5								

MCMATH REGION 12610 CMP DATE 7.2

				CALCIUM PLAGE DATA				SUNSPOT DATA							9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS INT FLUX
73	11	9	12610	S25 W32	65	100	2.0								
73	11	10	12610	S25 W45	62	100	1.0								

MCMATH REGION 12595 CMP DATE 8.3 RETURN OF REGION 12556 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA							9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS INT FLUX
73	11	2	12595	N13 E80	45	300	1.5								
73	11	3	12595	N14 E64	49	600	1.5								
73	11	4	12595	N15 E50	49	500	1.5								
73	11	5	12595	N15 E37	49	500	1.5								
73	11	6	12595	N15 E22	52	500	2.0								
73	11	7	12595	N15 E09	51	600	2.0								
73	11	8	12595	N15 W06	51	600	1.0								
73	11	9	12595	N15 W20	53	700	2.0								
73	11	10	12595	N15 W33	50	600	2.0								
73	11	12	12595	N15 W59	50	400	2.0								

MCMATH REGION 12598 CMP DATE 8.8 RETURN OF REGION 12571 ROTATION 2

				CALCIUM PLAGE DATA				SUNSPOT DATA							9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS INT FLUX
73	11	2	12598	S03 E82	43	300	1.0								
73	11	3	12598	S03 E70	43	300	1.0								
73	11	4	12598	S03 E56	43	200	1.0								
73	11	5	12598	S03 E43	43	300	1.0								
73	11	6	12598	S03 E29	45	300	1.0								
73	11	7	12598	S03 E15	45	400	1.5								
73	11	8	12598	S03 E01	44	400	1.5								
73	11	9	12598	S04 W12	45	400	1.5								
73	11	10	12598	S04 W29	46	200	2.0								
73	11	12	12598	S04 W53	44	200	2.0								

MCMATH REGION 12604 CMP DATE 9.0

				CALCIUM PLAGE DATA				SUNSPOT DATA							9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS INT FLUX
73	11	6	12604	N24 E32	42	200	1.5								
73	11	7	12604	N23 E18	42	300	1.0								

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MCMATH REGION 12605 CMP DATE 9.4

				CALCIUM PLAGE DATA				SUNSPOT DATA								9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS	INT FLUX
73	11	6	12605	S16 E38	36	200	1.8									
73	11	7	12605	S16 E24	36	100	1.0									

MCMATH REGION 12607 CMP DATE 9.5

				CALCIUM PLAGE DATA				SUNSPOT DATA								9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS	INT FLUX
73	11	7	12607	S08 E25	35	200	1.5									

MCMATH REGION 12616 CMP DATE 10.6

				CALCIUM PLAGE DATA				SUNSPOT DATA								9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS	INT FLUX
73	11	12	12616	S30 W29	20	100	1.5									

MCMATH REGION 12611 CMP DATE 11.1

				CALCIUM PLAGE DATA				SUNSPOT DATA								9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS	INT FLUX
73	11	9	12611	S07 E19	14	200	1.5									

MCMATH REGION 201 CMP DATE 11.7

				CALCIUM PLAGE DATA				SUNSPOT DATA								9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS	INT FLUX
73	11	11		S07 E04		202		19289	S08 W02	8	(A)	1 B	0	1	AXX	
73	11	12		S08 W10		234		19289	S08 W11	0	B	B	0	1	AXX	
73	11	13		S08 W22		260										
73	11	14		S09 W35		247		19289	S08 W33	0	B					

MCMATH REGION 12620 CMP DATE 11.9

				CALCIUM PLAGE DATA				SUNSPOT DATA								9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS	INT FLUX
73	11	16	12620	N15 W65	4	200	2.0									
73	11	17	12620	N15 W74	2	200	2.0									

MCMATH REGION 12617 CMP DATE 12.5

				CALCIUM PLAGE DATA				SUNSPOT DATA								9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS	INT FLUX
73	11	12	12617	N04 W04	356	100	2.0									
73	11	14	12617	N04 W29	357	200	2.0	19291	S02 W22	349	A					

MCMATH REGION 12619 CMP DATE 12.8

				CALCIUM PLAGE DATA				SUNSPOT DATA								9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS	INT FLUX
73	11	17	12619	S19 W63	351	100	1.5									

MCMATH REGION 12621 CMP DATE 13.0

				CALCIUM PLAGE DATA				SUNSPOT DATA								9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H STA	AREA	CNT	CLASS	INT FLUX
73	11	16	12621	S27 W50	349	200	1.5									
73	11	17	12621	S27 W59	347	200	2.0									

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MCMATH REGION 12609 CMP DATE 13.4

			CALCIUM PLAGE DATA					SUNSPOT DATA									9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	7	12609	N16 E80	341	200	3.0										
73	11	8	12609	N16 E60	346	200	3.0										
73	11	9	12609	N15 E49	345	100	2.5										

MCMATH REGION 12614 CMP DATE 13.7

			CALCIUM PLAGE DATA					SUNSPOT DATA									9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	10	12614	S22 E36	342	200	2.5										
73	11	12	12614	S22 E12	340	100	1.5										

MCMATH REGION 12615 CMP DATE 15.5

			CALCIUM PLAGE DATA					SUNSPOT DATA									9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	10	12615	S13 E66	312	100	1.5										
73	11	12	12615	S13 E36	316	100	1.5										

MCMATH REGION 12618 CMP DATE 19.0

			CALCIUM PLAGE DATA					SUNSPOT DATA									9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	12	12618	N13 E84	268	200	2.5	19290	N13 E83	267	AP		B	40	1	AXX	
73	11	13							N13 E68				B	70	3	HSX	
73	11	14	12618	N14 E63	265	1000	3.0	19290	N13 E57	270	(BP)	3	B	100	9	CSI	
73	11	15						19290	N13 E42	271	(BP)	4	B	70	8	CSI	
73	11	16	12618	N14 E32	267	1000	3.0	19290	N13 E29	271	(BP)	4	B	50	8	CSO	
73	11	17	12618	N14 E20	268	1000	3.0		N14 E17				B	30	5	CSO	
73	11	18						19290	N15 E02	269	BP		B	20	3	CSO	
73	11							19293	N18 E09	262	B						
73	11							19292	N14 E10	261	BP		B	0	2	AXX	
73	11	19						19290	N13 W12	272	(AP)	3	C	10	1	HRX	
73	11							19292	N13 E00	260	(A)	2					
73	11	20	12618	N14 W24	271	900	3.0	19290	N14 W25	272	(BP)	2	B	20	5	BXO	
73	11							19292	N13 W13	260							
73	11	21						19290	N14 W38	273							
73	11							19292	N13 W28	263		2	G	30	3	CRO	
73	11	22	12618	N14 W47	269	1300	2.5										
73	11	23	12618	N14 W58	267	1200	2.5	19292	N13 W55	260	A						

MCMATH REGION 12629 CMP DATE 19.3

			CALCIUM PLAGE DATA					SUNSPOT DATA									9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	22	12629	N08 W45	267	200	2.0										
73	11	23	12629	N08 W58	267	200	1.5										

MCMATH REGION 12623 CMP DATE 20.1 RETURN OF REGION 12577* ROTATION 5

			CALCIUM PLAGE DATA					SUNSPOT DATA									9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	16	12623	N15 E48	251	400	2.0										
73	11	17	12623	N15 E36	252	500	1.5										
73	11	20	12623	N14 W09	256	600	2.0										
73	11	22	12623	N15 W28	250	400	1.0										
73	11	23	12623	N15 W39	248	400	1.5										

*An asterisk beside the "Return of Region" number indicates that the new region is only part of the area of the old region.

REGIONS OF SOLAR ACTIVITY

NOVEMBER 1973

MCMATH REGION 12626 CMP DATE 22.0

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
73	11	21					
73	11	22	12626	S09 W09	231	400	3.0
73	11	23	12626	S09 W23	232	800	3.0
73	11	24					
73	11	25					
73	11						
73	11	26					
73	11						

SUNSPOT DATA 9.1 CM

MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
19295	S10 E04	231	(B)	2					
19295	S09 W10	232	(BP)	3	B	50	17	BXO	
19295	S09 W27	232	(BP)	4	B	50	10	CSO	
19295	S09 W36	232	(BP)	3	B	30	13	CRO	
19298	S12 W58	241	(BP)	2	A	0	3	BXO	
19295	S08 W49	232	(BF)	2	B	0	4	BXO	
19298	S12 W73	242	BP		G	30	4	BXO	
	S10 W61				G	0	1	AXX	

MCMATH REGION 12627 CMP DATE 23.2

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
73	11	22	12627	N25 E07	215	200	2.0
73	11	23	12627	N25 W06	215	100	1.0

SUNSPOT DATA 9.1 CM

MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX

MCMATH REGION 12624 CMP DATE 24.3 RETURN OF REGION 12584 ROTATION 6

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
73	11	17	12624	S13 E89	199	400	1.0
73	11	18					
73	11	20	12624	S13 E44	203	500	2.0
73	11	22	12624	S13 E21	201	700	2.0
73	11	23	12624	S13 E09	200	700	2.0
73	11	24					
73	11	25					
73	11	26					
73	11	27					
73	11	28					
73	11	29	12624	S13 W75	205	1400	3.0
73	11	30	12624	S12 W89	206	300	1.0

SUNSPOT DATA 9.1 CM

MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
19294	S11 E72	199			B	0	2	AXX	
19297	S11 E02	203	(AP)	1					
19297	S11 W09	205	AP						
19297	S10 W20	203	(AP)	2	B	0	2	AXX	
19297	S09 W34	203	BP		G	40	4	CRO	
19297	S10 W55	207	(BP	3	B	10	1	AXX	
19297	S10 W67	208	BF		B	20	2	BXO	
19297	S10 W78	205	AF		B	0	1	AXX	
19297	S05 W85	191	BP		R	50	3	CSO	

MCMATH REGION 12637 CMP DATE 24.9

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
73	11	29	12637	S09 W63	193	300	1.5

SUNSPOT DATA 9.1 CM

MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX

MCMATH REGION 12636 CMP DATE 25.3

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
73	11	25					
73	11	26					
73	11	27					
73	11	28					
73	11	29	12636	N06 W57	187	1500	3.0
73	11	30	12636	N06 W70	187	1400	3.0
73	12	1	12636	N06 W85	188	1100	2.5

SUNSPOT DATA 9.1 CM

MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
19299	N08 W02	185	(B)	2	B	0	3	BXO	
19299	N08 W15	184	BP		G	40	3	CRO	
19299	N06 W35	187	(BP)	4	B	50	9	CSI	
19299	N07 W47	188	BP						
19299	N07 W60	187	BP		B	80	9	CSI	

MCMATH REGION 12631 CMP DATE 25.6 RETURN OF REGION 12586 ROTATION 4

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
73	11	22	12631	N28 E39	183	300	1.0
73	11	23	12631	N28 E26	183	300	1.0

SUNSPOT DATA 9.1 CM

MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX

MCMATH REGION 12625 CMP DATE 26.0 RETURN OF REGION 12588 ROTATION 4

CALCIUM PLAGE DATA

YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT
73	11	20	12625	S14 E66	181	300	1.0
73	11	22	12625	S14 E42	180	1000	1.5
73	11	23	12625	S14 E30	179	900	2.0
73	11	29	12625	S14 W48	178	900	1.5
73	11	30	12625	S14 W60	177	300	1.0
73	12	1	12625	S15 W70	173	300	1.0

SUNSPOT DATA 9.1 CM

MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX

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MCMATH REGION 12630 CMP DATE 26.1

CALCIUM PLAGE DATA								SUNSPOT DATA									9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	22	12630	N39 E45	177	200	2.0										
73	11	23	12630	N39 E33	176	100	1.0										

MCMATH REGION 12638 CMP DATE 26.1

CALCIUM PLAGE DATA								SUNSPOT DATA									9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	28						19301	S09 W35	176	A		B	50	6	CSO	
73	11	29	12638	S08 W47	177	800	2.5	19301	S09 W48	175	BP		B	30	8	CAI	
73	11	30	12638	S08 W61	178	1000	3.0	19301	S09 W62	178	(BF)	4	R	80	4	DAO	
73	12	1	12638	S08 W73	176	1000	2.0		S09 W75				B	70	2	CSO	
73	12	2	12638	S09 W85	174	200	1.0										

MCMATH REGION 12635 CMP DATE 26.8

CALCIUM PLAGE DATA								SUNSPOT DATA									9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	23	12635	N61 E42	167	100	1.0										

MCMATH REGION 12632 CMP DATE 26.9 RETURN OF REGION 12589 ROTATION 4

CALCIUM PLAGE DATA								SUNSPOT DATA									9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	22	12632	N12 E55	167	500	1.0		N12 E68				B	400	20	DAO	
73	11	23	12632	N12 E42	167	500	1.5										
73	11	29	12632	N14 W36	166	600	1.0										
73	11	30	12632	N13 W48	165	600	1.0										

MCMATH REGION 12643 CMP DATE 27.1

CALCIUM PLAGE DATA								SUNSPOT DATA									9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	12	1	12643	S15 W60	163	200	2.0										
73	12	2	12643	S15 W72	161	200	1.0										

MCMATH REGION 12628 CMP DATE 28.1

CALCIUM PLAGE DATA								SUNSPOT DATA									9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	11	21						19296	S10 E78	157	(AP)	3	G	70	1	HRX	
73	11	22	12628	S10 E73	149	1500	3.5	19296	S09 E69	153	(BP)	3					
73	11	23	12628	S10 E60	149	1800	3.5	19296	S10 E52	153	(BP)	6	B	420	11	DHO	
73	11	24						19296	S10 E43	153	(BP)	5	B	380	22	DKO	
73	11	25						19296	S10 E29	154	(BP)	5	B	400	15	EKO	
73	11	26						19296	S10 E16	153	BP		G	320	16	EKI	
73	11	27						19296	S10 W02	154	(BP)	4	B	250	19	EKO	
73	11							19300	S15 E02	150	(B)	3	B	10	3	AXX	
73	11	28						19296	S11 W14	155	BP		B	150	20	CAI	
73	11							19300	S15 W10	151	BF		B	30	7	CSI	
73	11	29	12628	S10 W21	151	4000	3.5	19296	S11 W27	154	BP		B	230	19	CAO	
73	11							19300	S15 W23	150	BF		B	30	6	CSI	
73	11	30	12628	S10 W35	152	3700	3.5	19296	S10 W39	155	(BP)	5	R	150	18	DAI	
73	11							19300	S15 W36	152	(BF)	4	R	20	7	CSO	
73	12	1	12628	S10 W50	153	3300	3.5		S10 W52				B	170	11	DAI	
73	12		12628						S15 W48				B	20	3	CSO	
73	12	2	12628	S10 W62	151	2800	4.0	19300	S14 W65		(B)	3	B	140	34	CSI	
73	12		12628					19296	S10 W65		(BY)	3	B	70	5	CSO	
73	12	3	12628	S10 W75	151	2800	3.5	19296	S11 W79		(BF)	3	B	10	1	AXX	
73	12		12628					19300	S15 W79		(BF)	4	B	80	9	CSI	
73	12	4	12628						S13 W85				H	170	3	CRO	

MCMATH REGION 12644 CMP DATE 28.2

CALCIUM PLAGE DATA								SUNSPOT DATA									9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT FLUX
73	12	2	12644	N21 W58	147	200	1.5										

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MCMATH REGION 12633 CMP DATE 28.3 RETURN OF REGION 12590 ROTATION 4

				CALCIUM PLAGE DATA				SUNSPOT DATA								9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT	FLUX
73	11	22	12633	N20 E75	147	300	1.0											
73	11	23	12633	N20 E63	146	300	1.0											
73	11	29	12633	N20 W18	148	300	1.0											
73	11	30	12633	N20 W32	149	400	1.5											

MCMATH REGION 12634 CMP DATE 29.3

				CALCIUM PLAGE DATA				SUNSPOT DATA								9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT	FLUX
73	11	23	12634	S14 E80	129	600	1.5											
73	11	29	12634	S14 W04	134	400	1.5											
73	11	30	12634	S12 W17	134	400	1.5											
73	12	1	12634	S13 W29	132	400	1.5											
73	12	2	12634	S13 W42	131	300	1.5											
73	12	3	12634	S13 W55	131	400	1.5											

MCMATH REGION 12639 CMP DATE 30.6

				CALCIUM PLAGE DATA				SUNSPOT DATA								9.1 CM
YR	MO	DA	MC NO.	LAT CMD	L	AREA	INT	MW NO.	LAT CMD	L	MAG.	H	STA	AREA	CNT	CLASS	INT	FLUX
73	11	29	12639	N18 E14	116	300	1.0											
73	11	30	12639	N20 E00	117	400	1.0											
73	12	1	12639	N20 W15	118	300	1.0											
73	12	2	12639	N20 W30	119	300	1.0											

Note: Region 12618 is new plage which formed in the leading part of old region 12577 of the previous rotation.
Region 12628 has formed among remnants of old plage 12592.
No calcium spectroheliograms were obtained at the McMath-Hulbert Observatory on November 11, 13, 15, 18, 19, 21, 24-28, 1973.
No sunspot observations were made at Mt. Wilson Observatory on November 13 and 17, 1973.

DAILY CALCIUM PLAGE INDEX

NOVEMBER 1973

YR	MO	DAY	INDEX	YR	MO	DAY	INDEX	YR	MO	DAY	INDEX
73	11	1	19.3	73	11	11	*	73	11	21	*
73	11	2	15.6	73	11	12	1.2	73	11	22	8.7
73	11	3	12.6	73	11	13	*	73	11	23	11.3
73	11	4	6.8	73	11	14	1.6	73	11	24	*
73	11	5	4.5	73	11	15	*	73	11	25	*
73	11	6	4.0	73	11	16	3.3	73	11	26	*
73	11	7	3.9	73	11	17	3.6	73	11	27	*
73	11	8	2.8	73	11	18	*	73	11	28	*
73	11	9	2.5	73	11	19	*	73	11	29	20.2
73	11	10	2.1	73	11	20	4.3	73	11	30	15.3

* NO OBSERVATIONS

SOLAR X-RAYS M
SOLRAD 9

NO

NAVAL RESEARCH LABORATORY 1 - 8A HOURLY AVERAGES (10^{-3} ergs/c

DAY	1	2	3	4	5	6	7	8	9	10	11
1	0.19	0.16	0.26	0.33	0.30	0.54	0.17	0.17	0.17	0.17	0.16
2	1.29	0.55	0.22	0.24	0.15	0.12	0.13	0.11	0.13	0.14	0.14
3	83.8	7.02	2.90	1.55	0.67	0.55	0.37	0.23	0.19	0.18	0.15
4	0.14	0.13	0.13	0.13	0.11	0.13	0.14	0.13	0.16	0.16	0.30
5	0.15	0.13	0.12	0.11	0.11	0.12	0.16	0.11	0.10	0.13	0.12
6	0.13	0.10	0.11	0.16	0.20	0.32	0.18	0.14	0.15	0.14	0.17
7	0.12	0.09	0.14	0.13	0.12	0.11	0.11	0.10	0.12	0.16	0.10
8	0.12	0.14	0.13	0.09	0.11	0.14	0.12	0.15	0.15	0.11	0.17
9	0.16	0.12	0.11	0.14	0.12	0.12	0.11	0.14	0.14	0.12	0.12
10	0.16	0.16	0.11	0.11	0.14	0.10	0.15	0.17	0.11	0.15	0.12
11	0.11	0.14	0.11	0.15	0.11	0.12	0.12	0.13	0.10	0.12	0.19
12	0.11	0.15	0.13	0.14	0.12	0.11	0.12	0.13	0.15	0.12	0.11
13	0.18	0.13	0.11	0.12	0.11	0.12	0.14	0.14	0.16	0.17	0.14
14	0.13	0.11	0.11	0.15	0.14	0.16	0.11	0.13	0.14	0.14	0.15
15	0.15	0.13	0.10	0.11	0.11	0.09	0.13	0.13	0.11	0.17	0.14
16	0.12	0.15	0.10	0.13	0.13	0.11	0.12	0.13	0.13	0.12	0.09
17	0.12	0.12	0.10	0.10	0.13	0.12	0.10	0.11	0.15	0.10	0.19
18	0.12	0.13	0.12	0.14	0.13	0.11	0.12	0.14	0.11	0.17	0.10
19	0.12	0.13	0.11	0.13	0.13	0.11	0.13	0.11	0.13	0.15	0.11
20	0.12	0.12	0.14	0.15	0.11	0.12	0.11	0.13	0.25	0.18	0.14
21	0.12	0.16	0.14	0.13	0.13	0.18	0.13	0.33	0.31	0.18	0.16
22	0.12	0.17	0.16	0.17	0.14	0.16	0.17	0.19	0.15	0.17	0.14
23	0.20	0.16	0.19	0.17	0.14	0.18	0.22	0.14	0.18	0.22	0.25
24	0.39	0.18	0.14	0.14	0.16	0.16	0.15	0.16	0.14	0.12	0.16
25	0.15	0.14	0.12	0.15	0.36	0.16	0.16	0.17	0.12	0.95	0.30
26	0.25	0.18	0.18	0.18	2.95	0.96	0.18	0.52	0.21	0.35	0.32
27	0.23	0.22	0.22	0.28	0.27	0.30	0.20	0.35	0.30	0.25	0.18
28	0.22	0.28	0.18	0.17	0.18	0.54	1.16	0.36	0.28	0.41	0.58
29	0.19	0.19	0.19	0.37	1.27	1.02	0.75	0.80	0.24	0.21	0.32
30	0.23	0.19	0.42	0.26	0.21	0.35	0.36	0.18	0.80	1.76	0.95

S MEASURED BY SATELLITE
D 9 – EXPLORER 37

NOVEMBER 1973

gs/cm^2/sec)

HOUR													
11	12	13	14	15	16	17	18	19	20	21	22	23	24
16	0.14	0.16	0.17	0.14	0.14	0.14	0.19	0.97	6.05	4.41	1.02	0.75	0.57
14	0.13	0.17	0.14	0.16	0.21	0.17	0.17	0.17	0.17	0.12	0.15	0.14	0.12
15	0.19	0.16	0.19	0.14	0.17	0.10	0.19	0.15	0.15	0.14	0.11	0.15	0.11
30	0.11	0.20	0.15	0.19	0.17	0.23	0.15	0.17	1.56	2.67	0.65	0.39	0.18
12	0.14	0.15	0.13	0.11	0.19	0.11	0.17	0.10	0.15	0.12	0.15	0.11	0.12
17	0.15	0.12	0.12	0.14	0.15	0.14	0.12	0.11	0.12	0.10	0.15	0.10	0.09
10	0.20	0.15	0.16	0.09	0.17	0.16	0.17	0.19	0.15	0.13	0.12	0.09	0.11
17	0.13	0.20	0.11	0.16	0.15	0.10	0.14	0.10	0.15	0.10	0.12	0.12	0.13
12	0.22	0.16	0.20	0.10	0.15	0.14	0.11	0.10	0.11	0.15	0.11	0.11	0.10
12	0.14	0.13	0.18	0.16	0.14	0.12	0.13	0.14	0.14	0.19	0.10	0.11	0.13
19	0.10	0.19	0.11	0.14	0.13	0.16	0.16	0.12	0.14	0.10	0.12	0.11	0.12
11	0.20	0.16	0.12	0.18	0.11	0.16	0.10	0.15	0.11	0.10	0.14	0.13	0.12
14	0.24	0.14	0.20	0.15	0.13	0.12	0.11	0.12	0.13	0.12	0.10	0.13	0.10
15	0.11	0.16	0.19	0.17	0.11	0.10	0.11	0.13	0.11	0.13	0.12	0.15	0.09
14	0.14	0.20	0.11	0.18	0.14	0.17	0.13	0.13	0.16	0.13	0.09	0.14	0.13
09	0.14	0.10	0.15	0.13	0.13	0.15	0.12	0.14	0.12	0.13	0.11	0.14	0.21
19	0.17	0.18	0.16	0.10	0.18	0.14	0.17	0.11	0.13	0.10	0.11	0.12	0.13
10	0.17	0.14	0.14	0.16	0.12	0.15	0.12	0.16	0.34	0.14	0.14	0.19	0.09
11	0.16	0.16	0.15	0.14	0.13	0.16	0.10	0.15	0.13	0.15	0.26	0.12	0.11
14	0.13	0.13	0.12	0.10	0.12	0.10	0.14	0.98	0.36	0.26	0.13	0.21	0.14
16	0.15	0.19	0.24	0.35	0.21	0.16	0.17	0.32	0.20	0.19	0.13	0.17	0.30
14	0.20	0.13	0.22	0.14	0.13	0.14	0.18	0.22	0.22	0.30	0.36	0.28	0.21
25	0.18	0.19	0.22	0.13	0.20	0.13	0.23	0.17	0.15	0.17	0.19	0.18	0.25
16	0.15	0.12	0.15	0.13	0.16	0.18	0.17	0.12	0.17	0.88	0.13	0.13	0.11
30	0.19	0.14	0.15	0.28	0.30	0.19	0.15	0.14	0.15	0.17	0.12	0.28	0.31
32	0.28	0.16	1.77	0.56	1.61	0.20	0.21	0.23	0.18	0.20	0.28	0.25	0.36
18	0.15	0.18	0.20	0.49	0.23	0.38	0.24	0.37	0.21	0.25	0.18	0.15	0.15
58	0.36	0.25	0.17	0.19	0.26	0.32	0.27	0.19	0.22	0.17	0.16	0.19	0.23
32	0.22	0.23	0.25	0.30	0.45	0.21	0.18	0.24	0.22	0.19	0.19	0.20	0.18
95	0.42	0.42	0.48	0.34	0.45	1.46	1.26	0.77	2.30	2.88	0.32	0.21	0.18

SOLAR X-RAYS M
SOLRAD 9

NO

NAVAL RESEARCH LABORATORY 8 - 20A HOURLY AVERAGES (10^{-2} ergs/

DAY	1	2	3	4	5	6	7	8	9	10	11
1	0.31	0.29	0.37	0.51	0.46	0.58	0.33	0.30	0.28	0.25	0.26
2	1.15	0.73	0.40	0.33	0.26	0.24	0.25	0.23	0.22	0.21	0.21
3	15.1	3.80	1.70	1.09	0.61	0.53	0.40	0.34	0.30	0.25	0.23
4	0.17	0.16	0.15	0.15	0.16	0.15	0.15	0.15	0.15	0.17	0.26
5	0.13	0.12	0.10	0.10	0.08	0.08	0.07	0.08	0.08	0.07	0.07
6	0.06	0.06	0.06	0.06	0.17	0.35	0.24	0.16	0.14	0.12	0.10
7	0.05	0.06	0.06	0.06	0.05	0.06	0.06	0.06	0.06	0.06	0.06
8	0.05	0.06	0.05	0.06	0.06	0.06	0.05	0.06	0.07	0.06	0.06
9	0.05	0.05	0.05	0.05	0.06	0.05	0.05	0.06	0.05	0.05	0.05
10	0.05	0.06	0.05	0.05	0.06	0.05	0.06	0.05	0.05	0.05	0.05
11	0.05	0.05	0.05	0.06	0.05	0.05	0.06	0.05	0.05	0.05	0.06
12	0.05	0.05	0.05	0.06	0.06	0.06	0.05	0.05	0.05	0.05	0.05
13	0.09	0.10	0.07	0.08	0.07	0.06	0.08	0.09	0.13	0.10	0.08
14	0.06	0.06	0.07	0.08	0.07	0.07	0.07	0.09	0.08	0.08	0.09
15	0.07	0.06	0.07	0.06	0.07	0.06	0.07	0.08	0.08	0.08	0.08
16	0.09	0.07	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.08	0.07
17	0.07	0.07	0.09	0.07	0.07	0.07	0.07	0.08	0.08	0.08	0.07
18	0.08	0.08	0.08	0.09	0.09	0.10	0.10	0.10	0.11	0.10	0.10
19	0.10	0.09	0.08	0.09	0.09	0.08	0.11	0.10	0.08	0.08	0.07
20	0.09	0.08	0.08	0.09	0.12	0.12	0.11	0.10	0.21	0.13	0.10
21	0.15	0.15	0.17	0.18	0.19	0.22	0.22	0.39	0.42	0.29	0.25
22	0.25	0.26	0.28	0.26	0.28	0.25	0.29	0.28	0.23	0.24	0.29
23	0.32	0.32	0.33	0.37	0.34	0.34	0.30	0.29	0.28	0.31	0.36
24	0.47	0.29	0.19	0.23	0.22	0.22	0.22	0.21	0.20	0.20	0.19
25	0.19	0.22	0.23	0.24	0.35	0.21	0.21	0.24	0.22	0.49	0.33
26	0.32	0.32	0.33	0.32	1.58	0.96	0.31	0.45	0.35	0.42	0.47
27	0.41	0.41	0.39	0.47	0.43	0.47	0.40	0.46	0.52	0.44	0.33
28	0.36	0.46	0.36	0.36	0.36	0.58	1.14	0.64	0.54	0.52	0.78
29	0.35	0.34	0.37	0.50	0.88	0.98	0.92	0.90	0.49	0.38	0.47
30	0.48	0.43	0.54	0.50	0.45	0.57	0.54	0.44	0.76	1.33	1.11

MEASURED BY SATELLITE
D 9 - EXPLORER 37

NOVEMBER 1973

gs/cm^2/sec)

HOUR													
11	12	13	14	15	16	17	18	19	20	21	22	23	24
26	0.24	0.28	0.21	0.21	0.19	0.21	0.21	0.61	3.59	2.86	0.95	0.77	0.64
21	0.23	0.22	0.23	0.22	0.22	0.20	0.21	0.19	0.19	0.17	0.16	0.17	0.15
23	0.22	0.18	0.17	0.19	0.19	0.18	0.16	0.16	0.17	0.15	0.15	0.15	0.15
26	0.14	0.14	0.19	0.18	0.15	0.14	0.14	0.16	0.46	1.16	0.54	0.36	0.22
07	0.07	0.08	0.08	0.08	0.07	0.07	0.07	0.06	0.07	0.06	0.06	0.06	0.06
10	0.09	0.08	0.09	0.08	0.08	0.08	0.06	0.07	0.06	0.06	0.06	0.06	0.06
06	0.06	0.06	0.06	0.05	0.05	0.05	0.06	0.06	0.05	0.06	0.05	0.05	0.06
06	0.05	0.06	0.06	0.06	0.05	0.05	0.06	0.05	0.06	0.05	0.05	0.05	0.05
05	0.06	0.05	0.06	0.05	0.05	0.05	0.05	0.05	0.06	0.05	0.05	0.05	0.08
05	0.05	0.05	0.06	0.06	0.07	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
06	0.05	0.06	0.06	0.05	0.05	0.05	0.05	0.05	0.06	0.06	0.05	0.05	0.05
05	0.06	0.06	0.06	0.07	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06	0.06
08	0.12	0.08	0.10	0.09	0.06	0.06	0.05	0.06	0.07	0.06	0.06	0.05	0.06
09	0.11	0.10	0.06	0.07	0.06	0.08	0.08	0.07	0.06	0.06	0.07	0.08	0.06
08	0.08	0.09	0.08	0.08	0.07	0.07	0.09	0.08	0.08	0.08	0.08	0.09	0.08
07	0.08	0.08	0.07	0.08	0.09	0.12	0.10	0.12	0.08	0.08	0.08	0.08	0.08
07	0.09	0.09	0.09	0.08	0.09	0.09	0.11	0.10	0.08	0.08	0.08	0.10	0.08
10	0.10	0.11	0.11	0.14	0.13	0.12	0.09	0.13	0.32	0.08	0.15	0.17	0.10
07	0.09	0.10	0.11	0.09	0.08	0.09	0.09	0.08	0.08	0.09	0.16	0.09	0.08
10	0.12	0.13	0.12	0.12	0.11	0.12	0.14	0.41	0.43	0.34	0.17	0.17	0.15
25	0.23	0.25	0.31	0.41	0.33	0.26	0.26	0.40	0.28	0.28	0.25	0.25	0.34
29	0.33	0.29	0.26	0.25	0.26	0.26	0.29	0.33	0.34	0.43	0.46	0.43	0.38
36	0.32	0.30	0.35	0.27	0.24	0.25	0.29	0.27	0.22	0.24	0.24	0.23	0.33
19	0.20	0.21	0.22	0.22	0.24	0.25	0.23	0.24	0.25	0.63	0.21	0.21	0.20
33	0.28	0.25	0.25	0.32	0.37	0.33	0.27	0.25	0.24	0.23	0.22	0.34	0.37
47	0.39	0.32	0.89	0.47	0.76	0.35	0.41	0.37	0.36	0.34	0.43	0.42	0.48
33	0.33	0.35	0.39	0.56	0.40	0.52	0.44	0.43	0.37	0.37	0.35	0.35	0.35
78	0.64	0.48	0.40	0.39	0.39	0.44	0.44	0.40	0.39	0.37	0.34	0.35	0.37
47	0.45	0.48	0.48	0.54	0.60	0.39	0.42	0.43	0.46	0.41	0.43	0.41	0.38
11	0.72	0.71	0.69	0.60	0.71	1.35	1.37	1.04	1.59	2.24	0.69	0.53	0.45

SOLAR X-RAYS BY SATELLITE
EXPLORER 37
NOVEMBER 1973

NAVAL RESEARCH LABORATORY

OUTSTANDING EVENTS

DAY	START TIME	0.5-3A FLUX XE-5	PEAK TIME	1-8A FLUX XE-4	PEAK TIME	8-20A FLUX XE-3	PEAK TIME	END TIME	COMMENTS
1	1859	11.00D	1946E	79.00D	1946E	40.00D	1947E	2039	
3	0014	130.00	0015	1700.00	0025	410.00	0030	0210	
4	1958	11.00	1958	37.00	2001	13.00	2009	2014	
20	1834	14.00D	1836D	38.00	1835	13.00	1839	1839D	
26	0441	6.70	0444	40.00	0445	23.00	0448	0456	
26	1348	66.00	1350	180.00	1350	53.00	1350	1354	
26	1521	24.00	1521	57.00	1521	22.00	1522	1528	
30	0918	7.80	0918	35.00	0919	22.00	0921	0922	
30	1949	17.00	1953	51.00	2009	28.00	2010	2021	

Note: Data from SOLRAD 10 are not available after 2200 UT on June 11 due to a malfunction of the data storage system. Hourly flux values and X-ray flares will be reported from SOLRAD 9 until SOLRAD 10 resumes normal operation.

SUDDEN IONOSPHERIC DISTURBANCES

NOVEMBER 1973

DAY	UNIVERSAL TIME START	END	MAX	IMP	WIDE SPREAD INDEX	NUMBER OF STATION REPORTS BY TYPE SWF	SCNA	SEA	SPA	LF-SPA	SES	SFD	KNOWN FLARE	McMATH REGION
01	1900	2130	1930	1+	3						3		1925	12584
03	0014	0200	0026	2+	5	2			2			1	0014E	12584
05	1121	1135	1129	1-	1						1		*	
13	1643	1650	1644	1-	1	1							*	
20	1831	1900	1838	1	5			1		1	4		*	
23	2350	2356	2351	1-	1							1	2345	12628
24	2002	2016	2004	1-	1							1	2000	12628
24	2022	2030	2023	1-	1							1	2017E	12628
24	2217	2218	2218	1-	1							1	2218E	12628
25	2345	2349	2346	1-	1							1	2346	12625
26	0023	0031	0025	1-	1							1	0023	12628
26	0106	0111	0107	1-	1							1	0103	12628
26	0436	0527	0449	1-	1				1				0435	12637
26	0552	0656	0558	1	1				1				0554E	12628
26	1347	1425	1354	1-	5				2		1		1348E	12628
26	1520	1555	1528	1-	1				1		1		1520E	12628
26	2327	2333	2329	1-	1							1	2332E	12628
27	0122	0125	0124	1-	1							1	0124	12628
27	0311	0419	0316	1+	5	1			1				0312E	12628
30	1950	2050	1954	1+	5					1	4	1	1947	12628

STATIONS REPORTING FOR NOVEMBER 1973

AAVSO (A1, A17, A26, A32)(SEA) (A1, A19, A21, A30, A31, A33, A35, A37) (SES) (A31) (SWF)
BOULDER (BO) (SCNA, SEA)
HAWAII (HA) (SFD)
HERSTMONCEUX (HC) (SEA)
HIRAISO (HI) (SWF)
HOBART (TA) (SEA)
HUANCAYO (HU) (SWF)
INUBO (IN) (SPA)
MANILA (MA) (SWF, SPA)
MCMATH (MC) (SWF, SCNA)
PANSKA VES (PU) (SWF, SEA, SES)
POITIERS (PO) (SEA)
PRESTON (LO) (SEA)
SAO PAULO (UM) (SPA, SES)
SOFIA (SF) (SES)
TABLE MOUNTAIN (TM) (SWF, SPA, LF-SPA)
TORINO (TN) (SPA)
WHITE SANDS (WS) (SWF)

PERIODS OF NO OBSERVATIONS:

DATE	TIME (UT) and STATION
01-06	0000-2400 A37
01	0255-0429 TM
02-20	0000-2400 TA
03-30	0000-2400 A32
03	1251-1331 A31
05	2100-2110 BO
06	1140-1400 UM (16 kHz)
08-12	0000-2400 A35
08-30	1800-2400 A37
12	1248-1453 WS
14	1256-2400 MA
15	0045-1247 MC, 0400-1348 TM, 0900-2400 MA, 1200-1625 BO
16	0000-0400 MA, 0719-0800 MA
18-19	0905-1653 BO
20	1036-1153 UM (16 kHz), 1214-1345 UM (16 kHz)
23	1355-1619 UM (17 kHz)
26	0232-1431 BO, 1237-1830 MC
29	0625-1240 MC

SID's BY McMATH REGION

NOVEMBER 1973

DAY	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
REGION																														
84	1		1																											
25																									1					
28																							1	3		6	2			1
37																										1				
X-RAY																														
UNKNOWN																														
NO FP					1								1							1										

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1973

NOV. 1973	TIMES OF OBSERVATION		STATION	EVENTS												SPECTRAL TYPE
				CENTIMETRIC BAND			DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.	
01	0000	0716	CULG				0000	0325								IS,W
			CULG							0419		1				IIIB,U
			CULG							0421						IIIB,U,W
	0645	0728	WEIS													
	0951	1540	WEIS													
	1331	2338	HARV							1333	1613	1				IN
			HARV				1345	1619	1							IN
			HARV				1816	1846	1	1813	1850	1	1827	1850	1	I
	1330	2400	BOUL							1822.0	2242.0	2	1822.0	2242.0	2	IV
	1121	2132	SGMR										1830.4	2132.0	2	CONT
			HARV				1850	1928	1	1850	2043	2	1853	2043	2	IC
			HARV				1855	1858	2							UNCLF
			CULG							2005	2055	1				IS,CONT
	2005	2400	CULG							2005	2132	1				IIIS
			HARV							2043	2333	1				I
			CULG							2055	2400	1				IS
			CULG							2132	2400					IIIN,W
02			CULG							0000	0332	1				IS
	0000	0716	CULG							0000	0020					IIIN,W
	0721	1325	WEIS													
	1123	2131	SGMR													
	1330	2400	BOUL													
	1332	1624	WEIS													
	1331	2337	HARV	1916	1917	1	1915	1917	1	1915	1917	2				IIIG
	2015	2400	CULG							2027.5	2226					IIIN,W
			CULG							2036	2326	1				IS
			HARV							2045	2330	1				IN
			CULG				2106	2108								IS,W
03	0000	0716	CULG							0012	0018	2				IIIG,V
			CULG				0013	0035	2	0020	0050	1				IV
			CULG				0013	0015	2	0013	0015	2				UNCLF
			CULG							0015	0045	2	0020	0033	2	II, H
			CULG							0016	0045	1				
			CULG							0022	0035	1				P
	0650	1525	WEIS													
	1124	2129	SGMR													
	1330	2336	HARV													
	1330	2400	BOUL							1618.7	1618.9	1	1618.7	1618.9	1	III
			BOUL							1948.1	1948.5	1	1948.1	1948.5	1	III
	2015	2400	CULG													
04	0000	0716	CULG							0120						IIIB,W
	0938	1525	WEIS													
	1125	2128	SGMR													
	1331	2336	HARV							1915		2				UNCLF
			HARV							1935.8	1939	2				II
	1330	2400	BOUL							1935.8	1940.0	2				II
			BOUL							1945.5	1952.3	2				II
			HARV							1946	1953	2				II
	1950	2400	CULG							1950	1953	1				UNCLF
			CULG							1950	2152	1				IS,CONT
			BOUL							1950	2030	1	1950	2030		IV
			CULG							1955	1956.5	1				IIIG
			CULG							1956.5	2002					IIIN,W
05	0000	0716	CULG							0044.5						IIIG,W
	0650	0736	WEIS													
	0740	1525	WEIS													
	1126	2127	SGMR													
	1330	2400	BOUL													
	1345	2336	HARV													
	2016	2400	CULG													
06	0000	0715	CULG													
	0651	1525	WEIS													
	1128	2126	SGMR													
	1330	2400	BOUL													
	1345	2335	HARV													
	2018	2400	CULG							2211		1				IIIB
07	0000	0715	CULG													
	0651	1042	WEIS													
	1046	1526	WEIS													
	1129	2125	SGMR													
	1330	2337	BOUL													
	1346	2335	HARV													
	2016	2400	CULG													
08	0000	0715	CULG													
	0651	1527	WEIS													
	1130	2123	SGMR													
	1345	2334	HARV													
	1348	2400	BOUL													
	2016	2400	CULG													
09	0000	0715	CULG													
	1330	2400	BOUL													
	1345	2334	HARV													

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1973

NOV. 1973	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS: CENTIMETRIC BAND START UT	CENTIMETRIC BAND END UT	CENTIMETRIC BAND INT.	DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT.	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT.	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT.	SPECTRAL TYPE
09	1404	1514	WEIS													
	1132	2122	SGMR										1828.3	1828.8	2	III
	2046	2400	CULG													
10	0000	0715	CULG													
	0706	1509	WEIS													
	1133	2121	SGMR													
	1330	2400	BOUL													
	1345	2333	HARV													
	2017	2400	CULG													
11	0000	0715	CULG													
	0706	1509	WEIS													
	1134	2120	SGMR													
	1330	2400	BOUL													
	1345	2333	HARV													
	2017	2400	CULG													
12	0000	0716	CULG													
	0707	1020	WEIS													
	1330	1509	WEIS													
	1135	2119	SGMR													
	1330	2400	BOUL													
	1346	2333	HARV													
	2016	2400	CULG													
13	0000	0716	CULG													
	0707	1507	WEIS													
	1137	2116	SGMR													
	1345	2333	HARV													
	1330	2124	BOUL							1847.8	1850.0	1	1847.8	1850.0	1	III
	2017	2400	CULG													
14	0000	0716	CULG													
	0711	1428	WEIS													
	1138	2117	SGMR													
	1345	2333	HARV													
	1433	1507	WEIS													
	2017	2400	CULG							2205		1				IIIB
15	0000	0715	CULG													
	0710	1506	WEIS													
	1137	2116	SGMR													
	1330	2400	BOUL													
	1345	2333	HARV													
	2016	2400	CULG													
16	0000	0717	CULG													
	0712	1502	WEIS													
	1141	2115	SGMR													
	1330	2400	BOUL													
	1345	2332	HARV													
	2017	2400	CULG													
17	0000	0717	CULG													
	0715	0928	WEIS													
	0936	1503	WEIS													
	1142	2114	SGMR													
	1330	2400	BOUL													
	1345	2332	HARV													
	2017	2400	CULG													
18	0000	0717	CULG							0312	0313	1				UNCLF
	0716	1502	WEIS													
	1143	2114	SGMR													
	1330	2400	BOUL													
	1345	2332	HARV													
	2017	2400	CULG													
19	0000	0717	CULG				0534.5		1							UNCLF
			CULG							0535		1				UNCLF
	0717	1301	WEIS													
	1144	2113	SGMR													
	1345	2332	HARV													
	2017	2403	CULG							2120	2121	2				IIIG,U
	1330	2400	BOUL										2120.3	2120.8	1	III
20	0000	0717	CULG													
	1146	2112	SGMR													
	1333	1349	WEIS													
	1345	2332	HARV													
	1400	2400	BOUL													
	1434	1450	WEIS													
	2018	2400	CULG													
21	0000	0717	CULG							0317.5		1				IIIB
	0723	0920	WEIS													
	0925	1458	WEIS													
	1147	2111	SGMR													
	1345	2332	HARV													

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1973

NOV. 1973	TIMES OF OBSERVATION START UT	TIMES OF OBSERVATION END UT	STATION	EVENTS: CENTIMETRIC BAND START UT	CENTIMETRIC BAND END UT	CENTIMETRIC BAND INT.	DECIMETRIC BAND START UT	DECIMETRIC BAND END UT	DECIMETRIC BAND INT.	METRIC BAND START UT	METRIC BAND END UT	METRIC BAND INT.	DEKAMETRIC BAND START UT	DEKAMETRIC BAND END UT	DEKAMETRIC BAND INT.	SPECTRAL TYPE
21	1400	2400	BOUL													
	2018	2400	CULG									1				IIIB
22	0000	0718	CULG							0626.5		1				IIIB,U
	0724	0747	WEIS													
	0754	1115	WEIS													
	1400	2400	BOUL										1821.1	1821.5	1	III
	1345	2332	HARV							1822	1850	2	1822	1849	2	IIIN
			BOUL										1823.2	1823.8	1	III
			BOUL							1836.1	1836.4	1	1836.1	1836.4	1	III
			BOUL							1839.8	1841.0	1	1839.8	1841.0	1	III
			HARV							1840	1841	2	1840	1841	2	IIIG
	1148	2111	SGMR										1840.5	1840.9	1	III
			BOUL							1848.1	1848.3	1	1848.1	1848.3	1	III
			BOUL										2006.6	2007.6	1	III
	2019	2400	CULG							2102	2400					IS,W
			CULG				2112.5	2400								IN,W
23	0000	0718	CULG				0000	0410								IN,W
			CULG				0103	0103.5	1	0103	0104	2				IIIG,V
			CULG							0113						IIIB,W
			CULG							0118		1				IIIB
			CULG							0121.5		1				IIIB
			CULG							0124.5		1				IIIB
			CULG							0126	0129	2				IIIG
			CULG							0153		1				IIIB
			CULG				0410	0718	1	0000	0718	1				IS
			CULG							0420		1				IIIB
			CULG							0424		1				IIIB
			CULG							0435		1				IIIB
			CULG							0607		1				IIIB
			CULG							0612	0615	1				IIIG
			CULG							0714		1				IIIB
	1149	2110	SGMR													
	1345	2332	HARV							1352	2317	1				IN
	1		HARV				1605	1822	1							IN
			HARV							1645	1651	2	1645	1651	2	IIIGG
	1400	2400	BOUL							1645.5	1647.8	1	1645.5	1647.8	1	IIIG
			BOUL							1649.0	1650.4	1	1649.0	1650.4	1	IIIG
			CULG							2019	2400	1				IS
	2019	2400	CULG				2019	2400								IS,W
			CULG							2019	2400					IIIN,W
			HARV				2214	2216	3							I
			CULG				2252	2257								IIIG,W
24			CULG							0000	0400					IIIS,W
	0000	0719	CULG				0000	0719		0000	0719					IN,W
			CULG							0400	0719					IIIN,W
	1150	2109	SGMR													
	1400	2400	BOUL													IIIG
	2018	2400	CULG							2018	2400	1				IS
			CULG				2018	2400								IN,W
			CULG							2018	2400					IIIN,W
	1345	2332	HARV				2214	2216	3							I
25			CULG				0000	0719								IS,W
			CULG							0000	0719					IIIN,W
	0000	0719	CULG							0000	0719	1				IS
			CULG							0311	0313	2				IIIG
			CULG							0333		2				IIIB
			CULG							0645		2				IIIB
	1116	1459	WEIS													
	1151	2109	SGMR													
	1400	2400	BOUL													
	1401	2332	HARV							1401	1434	1				IN
			HARV							1434	2332	1				I
			HARV				1523	2308	1							IN
	2019	2400	CULG				2019	2400	1	2019	2400	1				IS
			CULG				2040	2400	1	2040	2400	1				IIIN,U
			CULG				2212	2214	1	2212	2214	1				IIIGG,U
			CULG				2253	2253.5	1	2253	2254	2				IIIG,U
			HARV							2253	2322	1				IIIN
			CULG				2304.5	2305	1	2304	2305	1				IIIG,U
			CULG				2310		1							IIIB,U
			CULG				2341.5	2353.5	2	2341.5	2353.5	2				IIIG,N,U
			CULG				2236	2237	1	2236	2237	1				IIIGG,U 1
26			CULG				0000	0728	1	0000	0728	1				IIIN
	0000	0728	CULG				0000	0728	1	0000	0728	1				IS
			CULG				0025.5	0030	2	0025.5	0030	2				IIIG,U
			CULG				0044	0044.5	1	0044	0044.5	2				IIIG,U
			CULG				0101	0112.5	1	0101	0112.5	2				IIIGG,U
			CULG				0106.5	0108.5	2	0106.5	0108.5	2	0107.5	0108.5	1	IIIGG,V,U
			CULG				0109.5	0110.5	1	0109.5	0111	2	0109.5	0110.5	1	IIIG,V
			CULG				0119	0122	1	0119	0122	1				IIIG
			CULG				0154	0156.5	1	0154	0156.5	2				IIIGG,U
			CULG				0222	0226	1	0222	0226	2				IIIG,U
			CULG				0227.5	0228.5	2	0227.5	0229	2				IIIG,U
			CULG				0329.5		1	0329.5		1				IIIB
			CULG							0332	0333	2				IIIG,V

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1973

NOV. 1973	TIMES OF OBSERVATION		STATION	EVENTS												SPECTRAL TYPE
				CENTIMETRIC BAND			DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.	
26			CULG				0433	0445	1							I,CONT
			CULG				0550	0558	2	0550	0558	2	0552.5	1555	1	IIIGG,V,U
			CULG				0620	0626	2	0620	0626	2				IIIG,U
			CULG				0703	0708.5	2	0703	0708.5	2				IIIGG,V,U
			CULG							0716	0718	2				IIIG,U
	0733	1451	WEIS							0758.0	1248.0	1				IN
			WEIS							0929.8	0931.5	2				IIIGG
			WEIS							0933.5	0934.5	1				IIIG
			WEIS							0937.3	0938.2	1				IIIG
			WEIS							0954.4	0957.2	2				IIIGG
			WEIS							0959.2	1000.2	1				IIIG
			WEIS							1018.5	1018.6	2				IIIG
			WEIS							1018.5	1018.6	2				IIIG
			WEIS							1054.4	1054.6	1				IIIG
			WEIS							1056.3	1057.5	1				IIIG
			WEIS							1059.8	1101.3	1				IIIG
			WEIS							1102.7	1106.1	3				IIIGG,V
			WEIS							1147.6	1148.5	1				IIIG
			WEIS							1326.0	1326.1	1				III8
			WEIS							1337.5	1338.0	2				IIIG
	1153	2100	SGMR										1337.7	1338.2	2	III
			SGMR										1340.3	1342.6	2	V
			WEIS							1340.5	1341.6	3				IIIGG
			WEIS							1348.2	1353.5	2				IIIGG
			SGMR										1348.8	1350.2	2	III
			WEIS							1355.6	1355.8	1				IIIG
	1401	2332	HARV							1401	2134	1				IN
			SGMR										1401.3	1403.9	1	II
			WEIS							1403.1	1403.9	1				II
			HARV				1405	1406	1	1405	1406	2				IIIG
			WEIS							1405.5	1406.0	1				IIIG
			HARV				1409	2113	1							IN
	1400	2400	BOUL							1424.0	1425.0	1	1424.0	1425.0	1	IIIG
			BOUL							1426.8	1431.3	2	1426.8	1431.3	2	IIIG
			HARV				1427	1431	2	1427	1428	2	1427	1428	2	IIIGG
			WEIS							1427.0	1428.1	2				IIIG
			SGMR										1427.3	1429.3	2	V
			BOUL							1433.1	1435.1	2	1433.1	1435.1	2	IIIG
			SGMR										1434.2	1434.6	1	III
			BOUL							1445	1610	1				IS
			BOUL							1452.4	1452.6	1	1452.4	1452.6	1	III
			HARV	1520	1522	3	1519	1526	3	1519	1527	3	1521	1527	3	IIIGG,U,V
			BOUL							1520.5	1525.0	3	1520.5	1525.0	3	IIIG
			SGMR										1520.9	1526.8	2	IIIG
			BOUL							1525.5	1527.2	2	1525.5	1527.2	2	IIIG
			BOUL							1605.6	1606.2	1				III
			HARV				1651	1653	2	1651	1654	2	1651	1654	2	IIIGG
			BOUL							1651.2	1655.0	2	1651.2	1655.0	2	IIIG
			BOUL							1722.0	1722.1	1	1722.0	1722.1	1	III
			BOUL							1728.8	1729.4	1	1728.8	1729.4	1	IIIG
			HARV				1729	1730	1	1729	1730	1				IIIG
			BOUL							1837.2	1839.9	1	1837.2	1839.9	1	IIIG
			HARV				1838	1841	1	1838	1840	1	1838	1840	1	IIIGG
			BOUL							1954.5	1958.2	2	1954.5	1958.2	2	IIIG
			SGMR										1954.8	1958.0	2	IIIG
			CULG				1955	1957.5	1	1955	1957.5	2				IIIGG
			CULG				1955	2400	1	1955	2400	1				IIIN
	1955	2400	CULG				1955	2400	1	1955	2400	1				IS
			HARV				1957		1	1954	1958	3	1954	1958	3	IIIGG
			BOUL							2050.5	2051.0	1	2050.5	2051.0	1	III
			CULG				2106	2107.5	2	2106	2107.5	3	2106.5	2107	1	IIIG,V,U
			HARV				2106	2107	3	2106	2107	3	2106	2107	3	IIIGG
			BOUL							2106.3	2107.4	3	2106.3	2107.4	3	III
			CULG				2140.5	2146	1	2140.5	2146	2	2144	2145	1	IIIGG,V
			BOUL							2140.8	2143.5	2	2140.8	2143.5	2	IIIG
			HARV				2141	2145	1	2141	2146	2	2141	2146	2	IIIGG
			BOUL							2143.6	2146.1	3	2143.6	2146.1	3	IIIG
			CULG				2223.5	2232	1	2223.5	2233	2				IIIGG
			BOUL							2228.2	2232.4	2	2228.2	2232.4	2	IIIG
			HARV							2229	2232	1				IIIG
			HARV				2307	2309	2	2307	2309	2				IIIG
			CULG				2307.5	2308.5	2	2307.5	2308.5	2				IIIG
			HARV							2312	2314	2				IIIGG
			CULG				2312.5	2314	1	2312.5	2314	2				IIIGG
			BOUL							2312.6	2313.6	1	2312.6	2313.6	1	IIIG
			BOUL							2317.7	2318.8	1	2317.7	2318.8	1	III
			CULG				2323	2331.5	2	2323	2333	3	2324.5	2333	1	IIIGG,N,V
			HARV				2323	2329	3	2323	2332	3	2323	2325	1	IIIGG
			BOUL							2328.0	2342.3	1	2328.0	2342.3	1	CONT
27	0000	0720	CULG				0000	0720	1	0000	0547	1				IS
			CULG				0000	0355	1	0030	0637	1				IIIN
			CULG				0123	0126	2	0123	0126	2				IIIG
			CULG				0250	0251.5	1	0250	0252	2	0250	0250.5	1	IIIGG,V
			CULG							0304	0306.5	2				IIIGG
			CULG				0310	0313	1	0311	0315.5	2	0314	0314.5	1	IIIGG,V
			CULG							0315	0320	2				II
			CULG							0346	0347.5	1				IIIG,V
			CULG				0350.5	0352	1	0350	0352.5	2	0351	0352	1	IIIGG,V
	0731	1039	WEIS													

SOLAR RADIO EMISSION
SPECTRAL OBSERVATIONS

NOVEMBER 1973

NOV. 1973	TIMES OF OBSERVATION		STATION	EVENTS												SPECTRAL TYPE
				CENTIMETRIC BAND			DECIMETRIC BAND			METRIC BAND			DEKAMETRIC BAND			
	START UT	END UT		START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.	START UT	END UT	INT.	
27	1046	1058	WEIS													
	1154	2106	SGMR													
	1330	1343	WEIS													
	1400	2400	BOUL													
	1406	1454	WEIS													
	1402	2332	HARV				1822	1823	1							IIIG
	2021	2400	CULG				2021	2400								IS,W
			CULG							2049	2333					IIIN,W
			CULG							2131	2400					IS,W
			HARV				2145	2325	1	2154	2332	1				IN
28	0000	0720	CULG				0000	0720		0000	0720					IS,W
	0728	1236	WEIS													
	1155	2107	SGMR													
	1400	2400	BOUL							1915.7	1916.9	1	1915.7	1916.9	1	IIIG
	1401	2332	HARV							1916	1917	3	1916	1917	3	IIIG
			CULG							2020	2326					IIIN,W
	2020	2400	CULG							2020	2400					IS,W
	1400	2400	BOUL										2245	2320	1	CONT
29	0000	0720	CULG							0000	0720					IS,W
			CULG				0257	0415								IS,W
			CULG							0306	0307	1				IIIG
			CULG							0337.5	0339	1				IIIG
			CULG							0516	0517	1				IIIG
	0754	1124	WEIS													
	1156	2107	SGMR													
	1400	2400	BOUL													
	1402	2333	HARV													
	2020	2400	CULG							2230	2230.5					IIIG,W
30	0000	0720	CULG													
	1157	2107	SGMR													
	1400	2330	BOUL													
	1401	1855	HARV													
	1904	2334	HARV										1651.6	1652.4	1	III
	2020	2400	CULG													

The symbols used in connection with the spectral type in describing the important bursts are as follows:

B = Single burst
G = Small group (< 10) of bursts
GG = Large group (> 10) of bursts
C = Underlying continuum (particularly with type I)
S = Storm in the sense of intermittent but apparently connected activity
N = Intermittent activity in this period
U = U-shaped burst of Type III
RS = Reverse slope burst
DP = Drifting pairs
DC = Drifting Chains
H = Herringbone
W = Weak
P = Pulsations
CONT = Continuum
UNCLF = Unclassified activity

Note: Beginning in May the frequency coverage at the Harvard Radio Astronomy Station, Fort Davis, Texas, has been extended from 10-2000 MHz to 10-4000 MHz.

Errata: The Type V dekameter burst observed on 29 April 1973 (2100.5-2337.0 UT) at Sagamore Hill should have been designated a Type IV burst.

SELECTED SOLAR EVENTS

NOVEMBER 1973

Culgoora

UT Date 1973 NOVEMBER	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. (R_e)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
2	0000	0430	80 160	1.3 1.5 - 1.8	285 285		1	I	
3	0019	0032	80	1.5	280		3	II, IV	Incomplete observations
5	0000	0045	160	1.4	290		1	III N	
22/23	2300	0440	160	1.2	100	r	2	I S	
23	0103		160 80 43	1.2 1.4	100 80			III G,V	
	0115	0130	160 80 43	1.2 1.4	100 80			III N	
23/24	2311	0425	160 80	1.1	90	r	2	I S	
24	0335	0425	160	0.9	230	ℓ		I	
24/25	2324	0333	160	1.1 0.9	90 90	r	2	I	
			80	0.7 0.7	90 110	r	1	I	
25	0311	0313	80 43	0.9	110		1	III G	
	0333		80 43	0.9	110		1	III B	
25/26	2253	0508	160 80	1.0	90-100	r		IS	Complex at least 3 centres
	2253	0506	80 43	0.7	95		2	III N,U	

SELECTED SOLAR EVENTS

NOVEMBER 1973

Culgoora

UT Date 1973 NOVEMBER	HELIOGRAPH EVENT							Spectral Type	REMARKS
	Start (UT)	End (UT)	Freq. (MHz)	Positions: Central Dist. ($R_\odot$)	Positions: Position Angle (Deg.)	Polarization	Intensity (1-3)		
26/27	2307	0353	160	0.2	270	ℓ		I	
	2307	0353	160 80 43	0.65	290		2	III GG,V,N	
	2307	0353	160 80 43	0.7	220		1	IIIN	
27	0315	0318	160 80	0.7	220		2	II	
27/28	2333	0421	160 80	0.5	290			I	
29	0000	0400	160	0.5 0.6	260 250			I	
	0155	0517	160 80	1.4	205			IIIG,N	

Days without Heliograph observations: NIL

EAST-WEST SOLAR SCANS

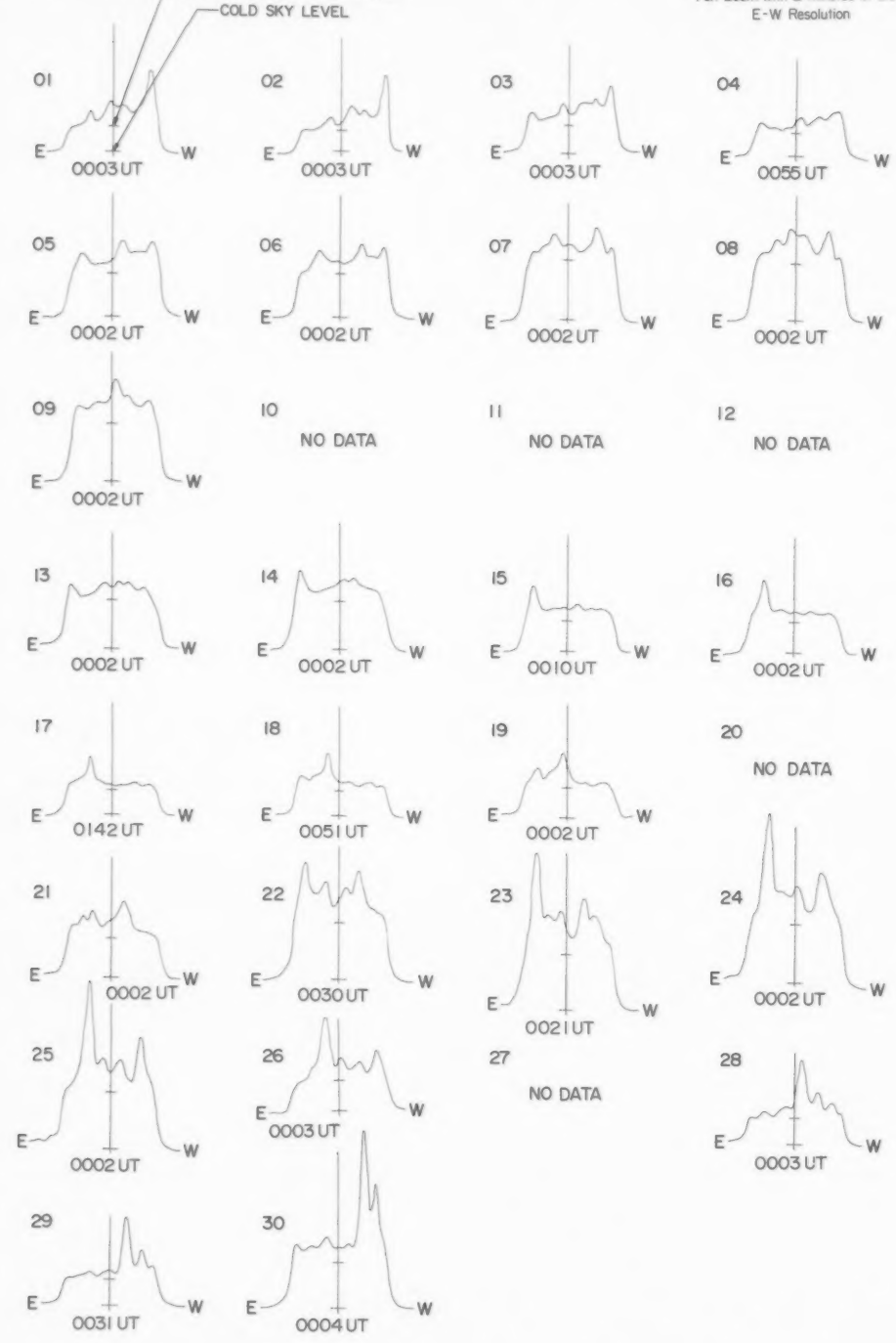
NOVEMBER 1973

Fleurs, Australia

ESTIMATED QUIET SUN LEVEL

COLD SKY LEVEL

21 cm
Fan-Beam with 2 minutes of arc
E-W Resolution



EAST-WEST SOLAR SCANS

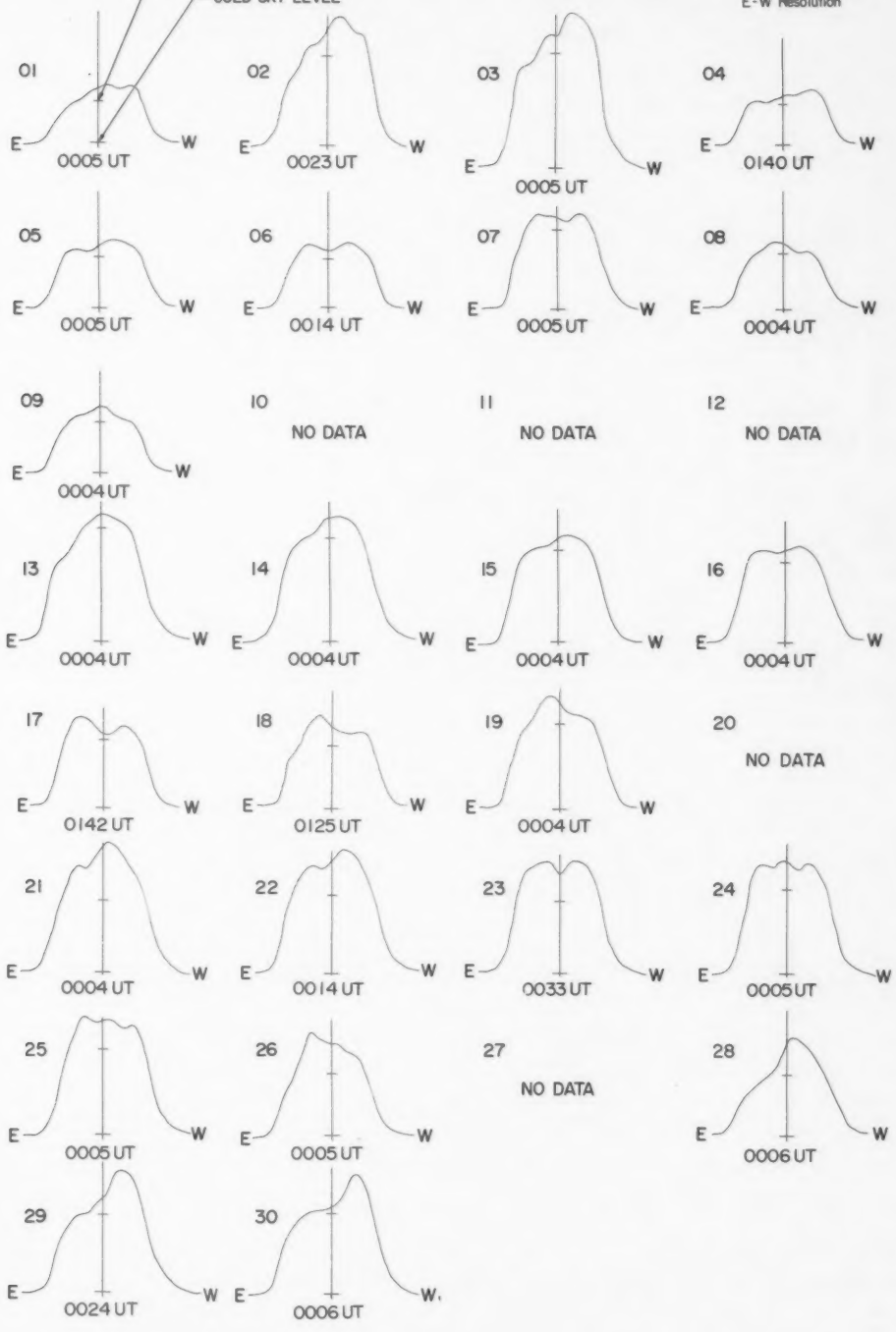
NOVEMBER 1973

Fleurs, Australia

ESTIMATED QUIET SUN LEVEL

COLD SKY LEVEL

43 cm
Fan-Beam with 4 minutes of arc
E-W Resolution



COSMIC RAY INDICES

(Neutron Monitors)

NOVEMBER 1973

Nov. 1973	THULE DAILY AVERAGE COUNTS PER HOUR	DEEP RIVER DAILY AVERAGE COUNTS PER HOUR	CALGARY DAILY AVERAGE COUNTS PER HOUR	SULPHUR MT. DAILY AVERAGE COUNTS PER HOUR	CLIMAX DAILY AVERAGE COUNTS PER HOUR	DALLAS DAILY AVERAGE COUNTS PER HOUR
1	4507.3	7013.4	11895.7	8838.0	not available at time of publication	6291.7
2	4508.7	7001.2	11950.6	8817.8		6289.2
3	4543.6	7062.2	12054.0	8899.7		6317.5
4	4544.7	7063.4	12055.4	8968.1		6316.3
5	4514.0	7027.2	11908.9(23)	8861.3		6288.5
6	4531.7	7052.3	11890.5	8871.3		6302.8
7	4576.5	7056.8	11964.8	8950.3(9)		6314.5
8	4596.3	7057.5	11952.0	8916.9		6316.5
9	4579.9	7099.0	11956.8	8935.3(19)		6336.8
10	4584.5	7111.2	11986.9	-- (0)		6352.8
11	4605.0	7105.0	11982.7	-- (0)		6368.3
12	4601.8	7095.8	11993.8	-- (0)		6372.2
13	4591.6	7094.9	12009.2	-- (0)		6370.3
14	4590.6	7088.2	12034.7	-- (0)		6375.1
15	4603.5	7101.7	12033.8	9024.1(6)		6384.6
16	4593.8	7132.1	12028.4	9030.9		6400.0
17	4582.3	7116.8	11991.8	8967.2		6385.6
18	4573.0	7103.4	11987.0	8960.8		6369.8
19	4585.5	7120.3	12027.0	8942.6		6368.4
20	4618.5	7127.6	12022.7	8965.8		6405.5
21	4619.0	7137.9	12098.9	9082.3		6435.8
22	4589.9	7104.3	12061.0	9001.5		6405.5
23	4612.8	7123.5	12097.0(23)	9036.4		6384.5
24	4618.2	7103.9	11984.5	8999.8		6387.0
25	4538.3	7039.5	11891.6	8954.6		6375.5
26	4560.9	7060.0	11949.3	8975.1		6370.8
27	4564.4	7048.0	11984.3	8955.7		6366.6
28	4600.5	7078.2	11944.0	8917.0		6379.6
29	4580.0	7109.2	11989.5	8893.4		6371.9
30	4592.2	7087.5	11985.2	8894.3		6367.6

( ) Number of hours for which data are available if less than 24 (or number of section hours if less than 40 for Climax).

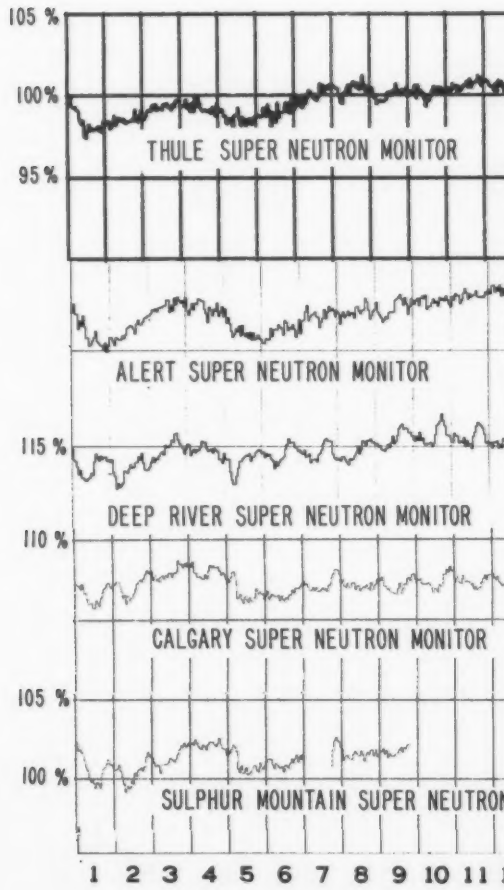
Churchill and Dallas Super Neutron Monitors, Scaling Factors 120.

Deep River Super Neutron Monitor, Scaling Factor 300.

Thule, Calgary and Sulphur Mountain Super Neutron Monitors, Scaling Factors 100.

Climax IGC Station B305, Scaling Factor 100.

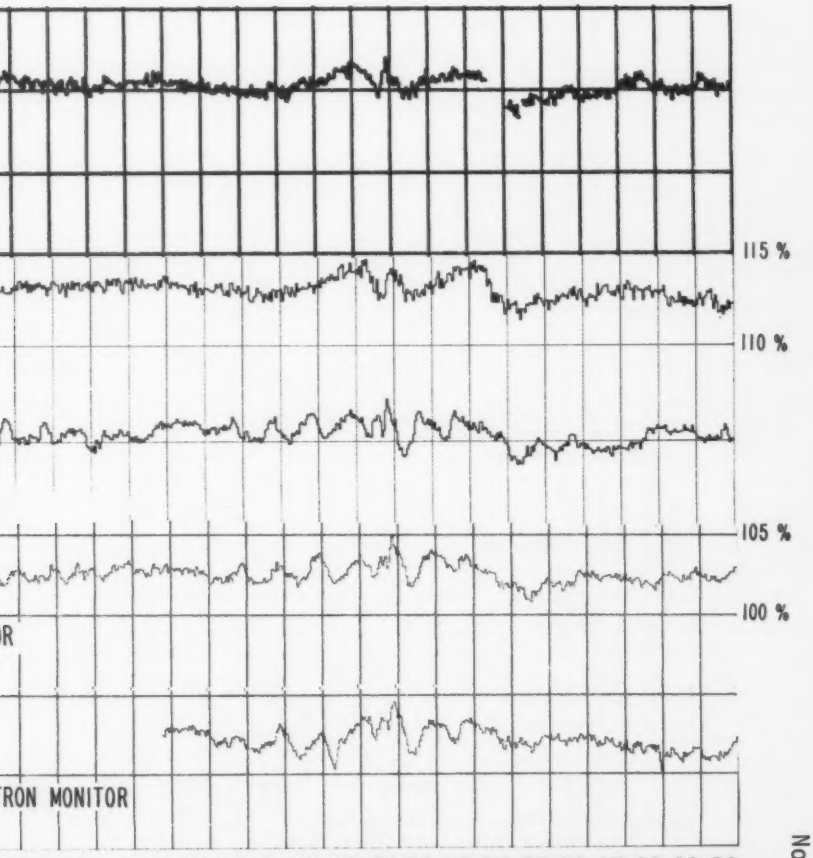
(Pressu


105 %
100%
95 %
THULE SUPER NEUTRON MONITOR
ALERT SUPER NEUTRON MONITOR
115 %
DEEP RIVER SUPER NEUTRON MONITOR
110 %
CALGARY SUPER NEUTRON MONITOR
105 %
100 %
SULPHUR MOUNTAIN SUPER NEUTRON
1 2 3 4 5 6 7 8 9 10 11

COSMIC RAY INDICES

essure Corrected Hourly Totals)

NOVEMBER 1973

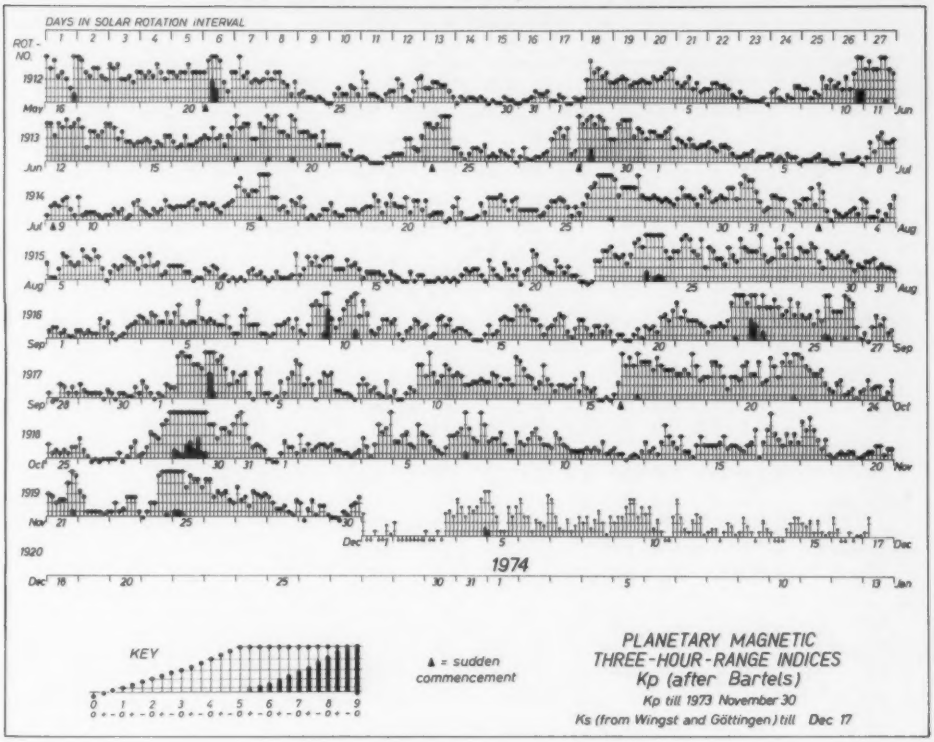


GEOMAGNETIC ACTIVITY INDICES

NOVEMBER 1973

DAY		K_p THREE-HOUR RANGE INDICES 1	2	3	4	5	6	7	8	SUM	C_i	C_p	A_p
1	QQ	0+	0	0	1	2+	2-	2-	1	8	0.2	0.1	4
2		3	1+	2	1+	2-	2	2	2-	15	0.4	0.4	7
3	QQ	2	1+	1+	1	1	1-	1	1+	10-	0.1	0.2	5
4		3-	2-	1-	2	4	3+	4-	5	23	1.1	1.0	18
5		2+	2+	3	3+	2	2-	4	3+	22	1.0	0.8	14
6		3	2+	2-	1+	1	2-	3	3	17	0.4	0.5	9
7	D	3+	4-	6-	4-	3-	2+	5	4	30+	1.3	1.2	28
8		2+	3-	3-	3+	2	1+	1+	3+	19	0.5	0.6	11
9		2+	2	3-	3+	4-	3-	2	2	21-	0.7	0.7	12
10		2-	3+	3-	2	2-	1+	1+	1+	15+	0.3	0.4	8
11	Q	1+	2-	1+	2-	1+	2+	1	1+	12	0.2	0.3	6
12	QQ	2-	1	1	0+	1-	1	1-	1+	8-	0.1	0.1	4
13		2+	1+	2-	1	2+	4	3	2+	18	0.6	0.6	10
14		2-	3	1+	1+	1-	2	3	2	15	0.4	0.4	8
15		2	2	2	2+	3	2-	2	2	17	0.5	0.4	8
16		2-	1+	2	2+	4-	1-	2+	4-	18-	0.6	0.6	10
17		5	3+	3-	2	3+	2+	3+	2+	24+	0.9	0.9	17
18	D	4+	4-	5-	4-	3-	2-	3-	1	24+	1.0	1.0	19
19	QQ	1-	1	1+	1	1+	1+	1-	1-	8	0.1	0.1	4
20	Q	1	1+	1+	2	2	1	2-	2-	12	0.1	0.2	6
21	D	3	3-	2	2+	2+	4	6-	5-	27-	1.2	1.1	23
22	Q	3+	3-	1	1	1	1	1-	1	12-	0.3	0.3	7
23		1	2	1	1+	3-	3-	3-	1	14+	0.4	0.4	8
24	D	0+	1	2	2	5-	5	5+	5	25+	1.3	1.2	26
25	D	6-	6-	5+	4-	5-	4+	4+	4-	37+	1.6	1.5	42
26		4+	4+	3-	3+	3	3+	2+	2	25+	1.0	1.0	18
27		4-	2+	3-	2-	3+	3	3-	3	22+	0.8	0.8	14
28	Q	3-	2	1+	1+	2-	1	1-	2+	13	0.4	0.3	6
29	Q	2	0	1+	2+	1-	2-	2-	1-	10+	0.4	0.2	5
30	QQ	0+	0+	0	1	1-	2-	2	3-	9-	0.2	0.2	4
										MEAN	0.60	0.58	12

GEOMAGNETIC ACTIVITY INDICES



DAILY AVERAGE INDICES Ap

	1972	1973										
DAY	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	6	11	17	22	91	17	3	19	12	5	5	4
2	5	2	14	40	54	12	20	11	16	6	31	7
3	6	2	16	14	26	9	14	7	7	6	48	5
4	4	11	7	4	9	8	19	4	8	12	12	18
5	2	21	9	6	7	5	10	4	9	15	10	14
6	3	20	15	28	4	13	8	3	13	9	12	9
7	10	8	14	8	4	16	4	3	8	8	6	28
8	6	15	25	7	8	17	6	13	9	8	6	11
9	4	16	21	11	7	12	9	8	5	44	10	12
10	2	28	11	8	4	7	33	6	4	27	21	8
11	3	24	8	8	24	6	34	6	4	12	11	6
12	8	25	9	14	3	7	30	6	5	7	15	4
13	30	16	4	5	46	20	24	8	18	8	17	10
14	9	8	7	4	57	80	18	8	8	4	7	8
15	29	9	8	3	9	37	13	32	4	12	6	8
16	33	8	10	12	60	32	11	15	3	14	30	10
17	13	5	16	6	51	27	18	6	2	10	27	17
18	8	3	11	20	46	22	30	6	4	7	22	19
19	7	10	10	82	42	21	38	10	6	3	20	4
20	4	29	9	80	46	23	18	9	9	12	20	6
21	2	22	49	58	42	46	6	5	6	15	37	23
22	14	5	46	53	44	20	3	6	12	17	20	7
23	30	13	48	50	25	15	10	14	22	63	6	8
24	13	22	54	49	14	4	34	6	46	28	7	26
25	4	20	31	50	14	6	6	9	29	27	5	42
26	5	20	34	32	28	8	4	36	18	25	3	18
27	2	33	44	28	26	10	4	29	26	8	4	14
28	4	33	20	22	26	8	21	14	28	4	20	6
29	15	22		16	59	3	41	18	20	4	86	5
30	19	15		15	18	3	29	19	13	4	28	4
31	13	6		33		4		26	9		19	
MEAN	10	16	20	25	30	17	17	12	12	14	18	12

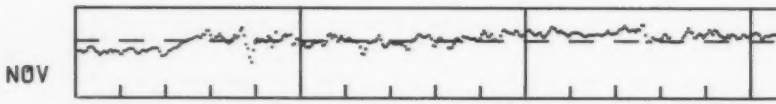
HOURLY EQUATORIAL Ds

NOVEME

NASA/GODDARD SPACE FLIGHT CENTER

(Time-UT)

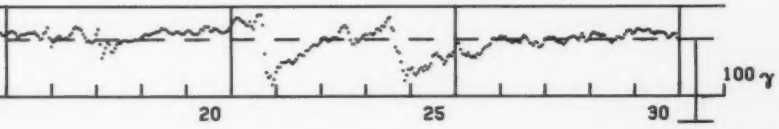
DAY	1	2	3	4	5	6	7	8	9	10	11	1
1	-13	-13	-13	-15	-14	-13	-9	-8	-8	-11	-14	-1
2	-17	-13	-13	-11	-10	-10	-11	-14	-16	-15	-14	-1
3	-16	-13	-12	-10	-9	-9	-7	-5	-3	-2	-1	
4	1	-1	4	5	8	6	2	-1	-3	-4	-2	
5	2	-2	1	1	-1	-2	5	2	-8	-2	10	-
6	-6	-4	-8	-8	-3	-6	-3	-2	-2	-1	-1	-
7	1	3	1	-1	0	-2	-1	-8	-16	-17	-10	-
8	-3	-4	-4	-4	-3	-5	-1	-7	-11	-10	-1	
9	-2	3	3	0	-1	0	-9	-9	-8	-4	2	
10	8	12	9	5	5	8	1	2	0	-1	6	1
11	12	13	11	9	7	7	9	10	6	4	8	
12	10	10	10	10	9	8	5	5	6	7	7	
13	10	13	14	15	16	15	12	12	13	13	11	1
14	4	8	8	4	4	-1	-1	-1	-1	-1	0	
15	9	13	11	8	13	12	9	6	5	3	4	
16	8	9	10	9	7	3	4	6	6	8	7	
17	-3	-2	2	4	3	0	0	2	1	5	8	1
18	12	-6	-23	-17	-10	-4	-6	-15	-16	-11	-6	-
19	4	6	6	5	6	7	8	9	9	10	13	1
20	11	10	8	6	6	6	8	12	11	15	15	1
21	19	23	25	25	23	21	20	17	16	21	15	1
22	-34	-34	-28	-28	-28	-27	-25	-28	-30	-27	-24	-2
23	1	2	1	-3	-2	1	2	2	1	9	13	1
24	6	7	8	5	7	12	12	10	15	15	20	2
25	-35	-42	-48	-41	-37	-35	-39	-33	-37	-34	-30	-2
26	-8	-5	-13	-18	-19	-21	-17	-21	-23	-21	-23	-1
27	3	2	2	-2	-1	-4	-5	-3	-2	-4	-5	
28	0	2	1	1	2	-3	-4	-5	-5	-7	-5	-
29	5	8	7	5	6	3	5	4	0	-1	-3	-
30	10	12	11	10	9	10	11	11	8	7	6	



Dst VALUES (PROVISIONAL)

EMBER 1973

12	13	14	15	16	17	18	19	20	21	22	23	24
-15	-18	-16	-14	-14	-16	-13	-12	-15	-13	-14	-14	-17
-12	-13	-14	-12	-11	-9	-10	-9	-10	-11	-19	-19	-18
1	1	2	3	4	5	4	3	7	7	12	12	6
2	6	3	5	12	15	6	-5	-10	-21	-27	-12	-3
-1	0	1	5	7	5	6	7	-5	-4	2	2	-5
-6	-5	-1	5	8	3	6	5	-1	2	5	1	1
-2	-3	-2	0	-1	2	6	1	-5	-8	-7	-4	-2
1	1	4	7	7	5	4	4	6	5	2	-6	-7
3	0	-1	5	4	4	3	2	2	3	0	0	3
12	13	11	10	9	9	8	12	11	7	5	7	8
9	12	16	15	14	11	10	12	10	9	7	5	8
7	7	8	8	7	5	8	9	12	9	8	9	9
14	13	19	19	7	-1	0	-1	4	2	1	2	1
4	7	11	15	11	10	4	4	7	9	7	4	7
7	4	6	7	6	3	4	4	8	7	5	4	7
8	8	3	9	6	4	0	1	7	9	14	2	-9
13	15	13	13	11	6	2	-3	-2	-4	-4	-2	6
-3	-5	-2	-1	-1	-3	-2	-2	-1	0	-1	0	2
12	12	10	8	7	6	8	9	9	7	6	6	9
15	10	10	13	12	11	9	8	8	9	10	13	15
12	21	28	29	29	17	-18	-41	-47	-45	-56	-49	-40
-20	-18	-20	-20	-14	-14	-12	-9	-7	-7	-8	-6	-3
15	16	13	8	-1	-6	-6	0	-4	-1	1	4	6
24	26	13	10	-10	-15	-17	-28	-39	-51	-44	-37	-37
-21	-19	-17	-21	-22	-25	-31	-27	-22	-19	-21	-16	-9
-18	-19	-17	-13	-10	-9	-8	-6	0	1	-1	0	3
1	4	2	-1	-5	-6	-8	-4	-5	-10	-9	-7	-2
-2	1	2	3	3	1	-2	2	6	2	-3	-2	1
-5	-2	-1	2	2	0	1	5	9	10	10	6	7
8	8	7	8	7	5	1	2	4	5	6	1	-2



PRINCIPAL MAGNETIC STORMS

NOVEMBER 1973

DATE 1973 MO DA	STORM TIME UT START	STORM TIME UT END MO DA HR	OBS	GEO-MAG LAT.	SUDDEN COMMENCEMENT TYPE	AMPLITUDES D(')	AMPLITUDES H(γ)	AMPLITUDES Z(γ)	C FIGURE DEGREE OF ACTIVITY	MAXIMAL ACTIVITY ON K-SCALE 0 TO 9 MO DA	3-HOUR PERIOD	K INDEX	RANGES D (')	RANGES H (γ)	RANGES Z (γ)	STORM NUMBERS
11 04	0410	11 05 09	HYDE	7.6N	..	..	..	..	M	11 04	5.7.8	4	4	92	15	53
	11--	11 06 00	HRMN	33.3S	..	..	..	..	-	11 04	8	5	23	80	86	53
	11--	11 06 09	KGLN	57.3S	..	..	..	..	-	11 04	7.8	5	--	--	--	53
11 05	0954	-- -- --	HYDE	7.6N	SC	- 0.1	+14	- 2	-	-- --	-	-	--	--	--	53
11 06	18--	11 07 24	WITT	54.1N	..	..	..	..	MS	11 07	7	6	30	160	20	54
	14--	11 07 22	IRKU	40.8N	..	..	..	..	M	11 07	3.4	5	14	107	26	54
11 07	0615	11 08 18	NEWP	55.1N	..	..	..	..	-	11 07	3.4	5	33	153	115	54
	0200	11 08 15	HYDE	7.6N	..	..	..	..	M	11 07	3.7	5	3	83	15	54
	0153	11 08 14	GUAM	4.0N	..	..	..	..	M	11 07	0.4	5	0	130	20	54
	03--	11 08 00	PMOR	18.6S	..	..	..	..	-	11 07	3.4	5	5	90	50	54
11 21	14--	11 22 06	WITT	54.1N	..	..	..	..	MS	11 21	7	6	30	140	50	54
11 16	1000	11 18 16	HYDE	7.6N	..	..	..	..	M	11 16	7	4	3	68	23	55
11 20	23--	11 22 06	KGLN	57.3S	..	..	..	..	-	11 21	7.8	6	--	--	--	56
11 21	09--	11 22 05	COLL	64.6N	..	..	..	..	MS	11 21	6.7	6	123	920	310	56
	04--	11 22 06	IRKU	40.8N	..	..	..	..	MS	11 21	6	6	21	116	26	56
	1330	11 22 04	SJUA	29.9N	..	..	..	..	M	11 21	6	5	10	126	37	56
	03--	11 22 11	ALIB	9.5N	..	..	..	..	MS	11 21	6	6	3	152	14	56
	0300	11 22 06	HYDE	7.6N	..	..	..	..	MS	11 21	6.7	6	3	156	11	56
	0329	11 22 07	GUAM	4.0N	..	..	..	..	M	11 21	0.6	5	0	100	20	56
	03--	11 22 11	ANNA	1.5N	..	..	..	..	MS	-- --	-	-	3	159	58	56
	03--	11 22 11	TVAN	1.1S	..	..	..	..	MS	-- --	-	-	2	164	100	56
	03--	11 22 09	APIA	16.1S	..	..	..	..	M	11 21	6	5	4	74	18	56
	03--	11 23 00	PMOR	18.6S	..	..	..	..	-	11 21	6.7.8	5	6	100	30	56
	04--	11 22 03	HRMN	33.3S	..	..	..	..	-	11 21	6.7	6	31	132	140	56
	03--	11 22 03	GNAN	43.2S	..	..	..	..	MS	11 21	7	6	16	100	100	56
11 24	07--	11 26 19	COLL	64.6N	..	..	..	..	MS	11 25	3	7	245	1290	910	57
	07--	11 26 18	SITK	60.0N	..	..	..	..	-	11 25	3	6	70	450	420	57
	0659	11 27 19	NEWP	55.1N	SC	5	13	--	-	11 25	1.3	6	59	153	223	57
	13--	11 25 23	WITT	54.1N	..	..	..	..	MS	11 24	7	6	40	200	95	57
	13--	11 26 11	FRED	49.6N	..	..	..	..	MS	11 25	1	6	31	120	70	57
	07--	11 26 20	BOUL	49.0N	..	..	..	..	MS	11 25	1	6	40	125	85	57
	09--	11 25 23	IRKU	40.8N	..	..	..	..	-	11 24	5.7	6	24	138	39	57
										11 25	5	6				57
	07--	11 27 15	TUCS	40.4N	..	..	..	..	MS	11 25	1.3	6	19	115	40	57
	1100	11 25 04	SJUA	29.9N	..	..	..	..	M	11 24	5	5	9	130	37	57
	05--	11 25 09	ALIB	9.5N	..	..	..	..	MS	11 24	5	6	3	132	17	57
	0300	11 26 19	HYDE	7.6N	..	..	..	..	MS	11 24	5.6	6	3	135	15	57
	1036	11 26 19	GUAM	4.0N	..	..	..	..	M	11 24	0.5	5	0	90	30	57
	05--	11 25 09	ANNA	1.5N	..	..	..	..	MS	-- --	-	-	4	151	47	57
	05--	11 25 09	TVAN	1.1S	..	..	..	..	MS	-- --	-	-	4	150	105	57
	03--	11 26 11	APIA	16.1S	..	..	..	..	M	11 25	4	5	6	88	30	57
	11--	11 26 18	PMOR	18.6S	..	..	..	..	-	11 24	7	5	7	90	50	57
	10--	11 26 07	HRMN	33.3S	..	..	..	..	-	11 24	7	5	24	111	121	57
										11 25	1.7	5				57
	05--	11 26 19	GNAN	43.2S	..	..	..	..	MS	11 24	5	6	17	110	120	57
	06--	11 26 19	KGLN	57.3S	..	..	..	..	-	11 24	6.7.8	6	--	--	--	57
										11 25	1					57

Reports were received from the following observatories:

College Witteveen Fredericksburg Irkutsk San Juan Hyderabad Annamalainagar Apia Hermanus Port-aux-Francais
Sitka Newport Boulder Tucson Alibag Guam Trivandrum Port Moresby Gnangara

SUDDEN COMMENCEMENTS AND SOLAR FLARE EFFECTS

NOVEMBER 1973

PRELIMINARY REPORT ON RAPID MAGNETIC VARIATIONS (by Dr. A. Romana)

The meaning of the station symbols is given in the IAGA-Bulletins nr. 12 and 32. Times of ssc, si and bay-commencements are mean values. If given by ten or more stations they are underlined.

Sudden commencements followed by a magnetic storm or a period of storminess (ssc)

NONE

Sudden impulses found in the magnetograms (si)

05 0954 A: LM; B: WN FU TI? PM GN; C: ES EB KA SS SZ KG (ssc: A: SO LG; B: IK PP; C: HU - bp: B: MA DU)

Rapid variations in form of bays (b, bs, bp, bps)

02 0003 bs: A: KS - bp: A: PE SZ; B: WI MA FU IK EB CI TL TI; C: WN - bps: A: LG; C: NI

04 2116 bp: A: WI MA EB TI LM - bps: A: WN FU LG IK TL PE; B: DO NI (ssc: A: KS - si: B: PP)

15 1251 bp: A: PM; B: IK EB KA TI SS TO DU - bps: B: GN

17 1404 bp: B: KA TI TO DU; C: SS

18 1921 b: A: PE - bs: A: KS - bp: A: FU LG TL; B: MA IK CI TI LM; C: NI - bps: B: SZ

29 1911 bp: A: NU LG; B: MA FU IK PE TI LM PP; C: EB TL - bps: B: DO WN SZ; C: WI

Giant pulsations (pg)

07 1450 - 1515 FUA
21 0518 - 0745 FUA
25 1230 - 1337 WN (240, 21) MAA FUA

Solar-flare effects (sfe)

Effects confirmed by ionospheric or solar observations are underlined.

26 0933 - 0949 SZ

p.t.o.

RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

NOVEMBER 1973

North Atlantic

NOV. 1973	WHOLE DAY INDICES NORTH ATLANTIC	ADVANCE FORECASTS (JC-REPORTS) FOR WHOLE DAY	NORTH ATLANTIC								GEOMAGNETIC INDICES		
			6-HOURLY QUALITY FIGURES				SHORT-TERM FORECASTS ISSUED ABOUT ONE HOUR IN ADVANCE OF				K_{FR}		A_{FR}
			00 TO 06	06 TO 12	12 TO 18	18 TO 24	02	08	14	20	HALF DAY (1)	HALF DAY (2)	OBSERVED
01	6-	6	5o	5-	7-	6+	4	5	6	6	0	1	2
02	6+	6	7-	6-	7o	6+	5	6	5	6	2	1	6
03	7-	7	7-	7-	6+	6+	6	5	5	5	2	2	6
04	6+	7	6+	6o	6+	7-	5	6	6	5	2	(4)	14
05	6+	7	6+	5+	6+	7o	5	5	5	6	3	2	11
06	6+	6	6+	6o	7o	6o	6	6	6	6	2	2	9
07	6o	6	6o	6o	6+	6-	6	6	5	6	(4)	3	20
08	6o	6	6-	5o	7-	6-	6	5	5	6	3	2	9
09	6-	6	5+	5o	6+	6+	6	5	5	6	2	2	8
10	6+	6	6o	6+	7-	6+	6	5	5	5	2	2	7
11	6+	6	7-	6+	7-	6+	6	6	5	5	1	1	4
12	6+	5	6+	6o	7-	6o	5	5	5	6	1	1	3
13	6+	5	6+	6o	7-	6+	6	6	5	6	1	2	7
14	7-	6	7-	7-	7o	7o	5	5	5	6	2	2	6
15	7-	6	6o	6+	7o	7-	6	5	5	6	2	2	6
16	6o	6	6o	6-	7-	6-	6	5	5	5	2	2	10
17	6o	6	6-	6o	7-	6o	5	5	5	5	3	3	15
18	6o	6	6-	6-	7-	6+	5	5	5	5	(4)	2	16
19	6+	6	6o	6o	7-	6o	5	5	5	6	1	1	2
20	6o	7	6o	6-	6+	6o	6	6	5	6	1	1	4
21	6+	7	6o	6+	7-	6o	6	5	5	6	2	3	14
22	6o	7	6-	5+	7-	6+	5	5	5	5	2	1	6
23	6o	6	6-	6-	7-	6o	5	6	6	6	1	2	4
24	5+	6	5o	6-	6o	5-	6	6	6	5	2	(4)	16
25	5o	5	4o	5-	6o	6-	4	4	4	4	(5)	(4)	34
26	5o	5	4o	5-	7-	5o	4	4	5	5	(4)	2	17
27	5o	5	5-	4+	6o	6-	5	5	5	6	2	2	9
28	5+	6	5+	4+	6-	6-	5	6	6	6	2	1	4
29	6o	6	6o	5+	7-	6-	6	6	6	6	2	1	4
30	6-	7	6-	5+	7-	6-	6	6	6	7	0	1	1

RADIO PROPAGATION QUALITY FIGURES AND FORECASTS

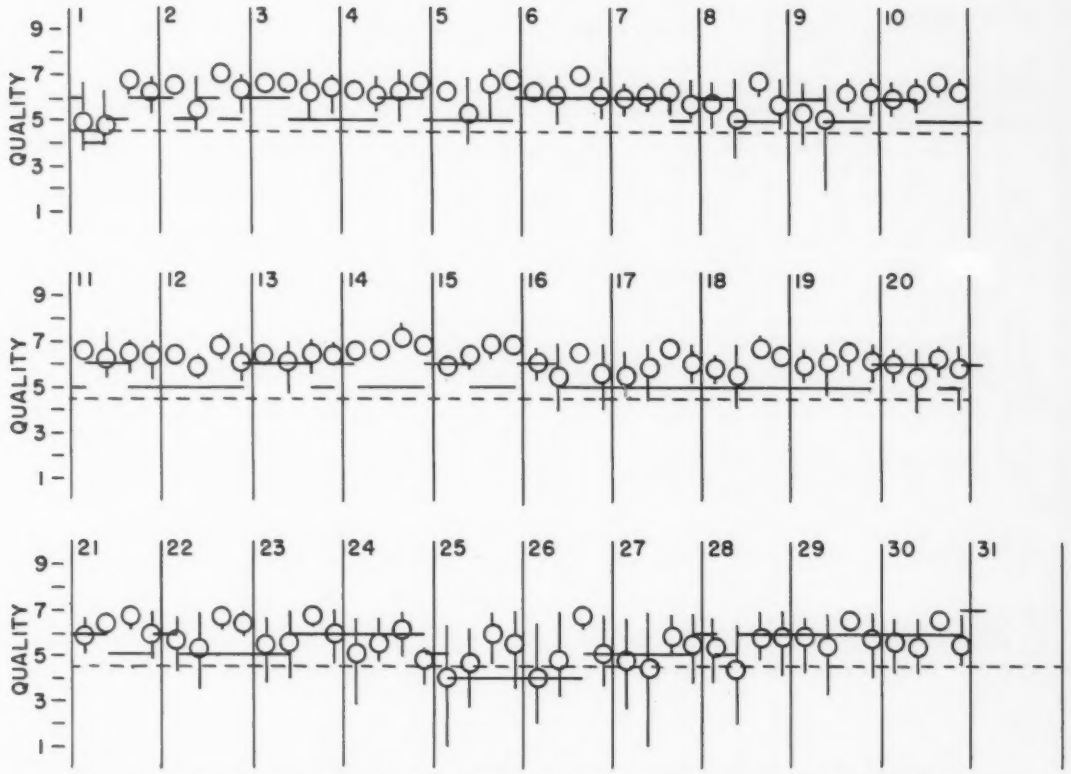
NOVEMBER 1973

North Atlantic

– Short term forecast
o Quality figure

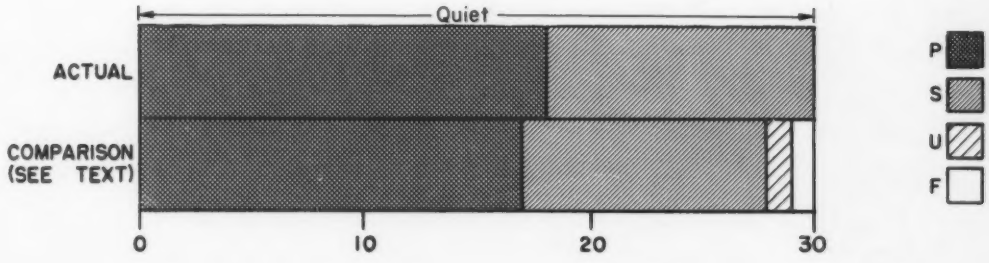
| range of reports

Day



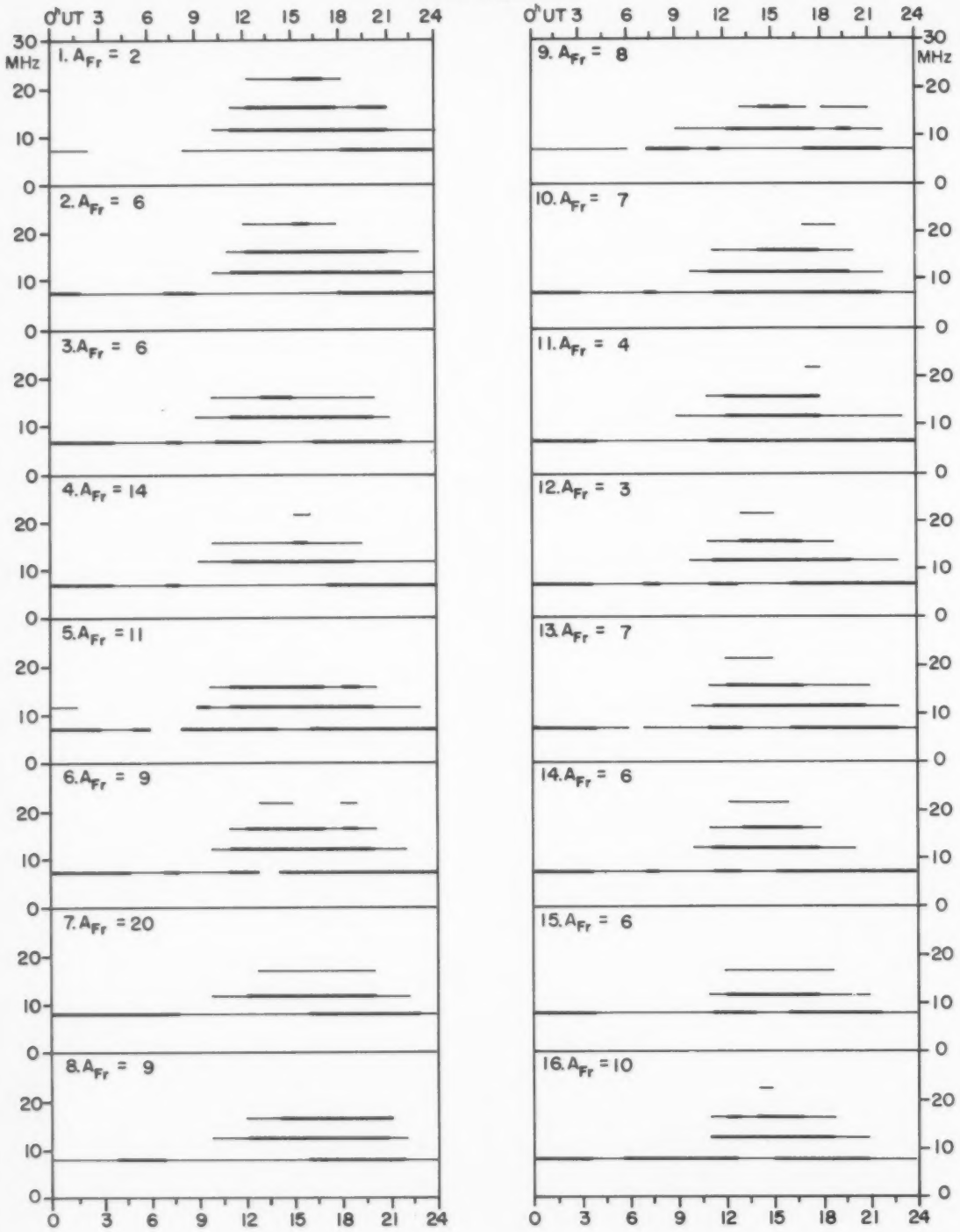
Outcome of advance forecasts of High Latitude radio propagation conditions
(scored against observed North Atlantic radio propagation conditions)

HIGH LATITUDE



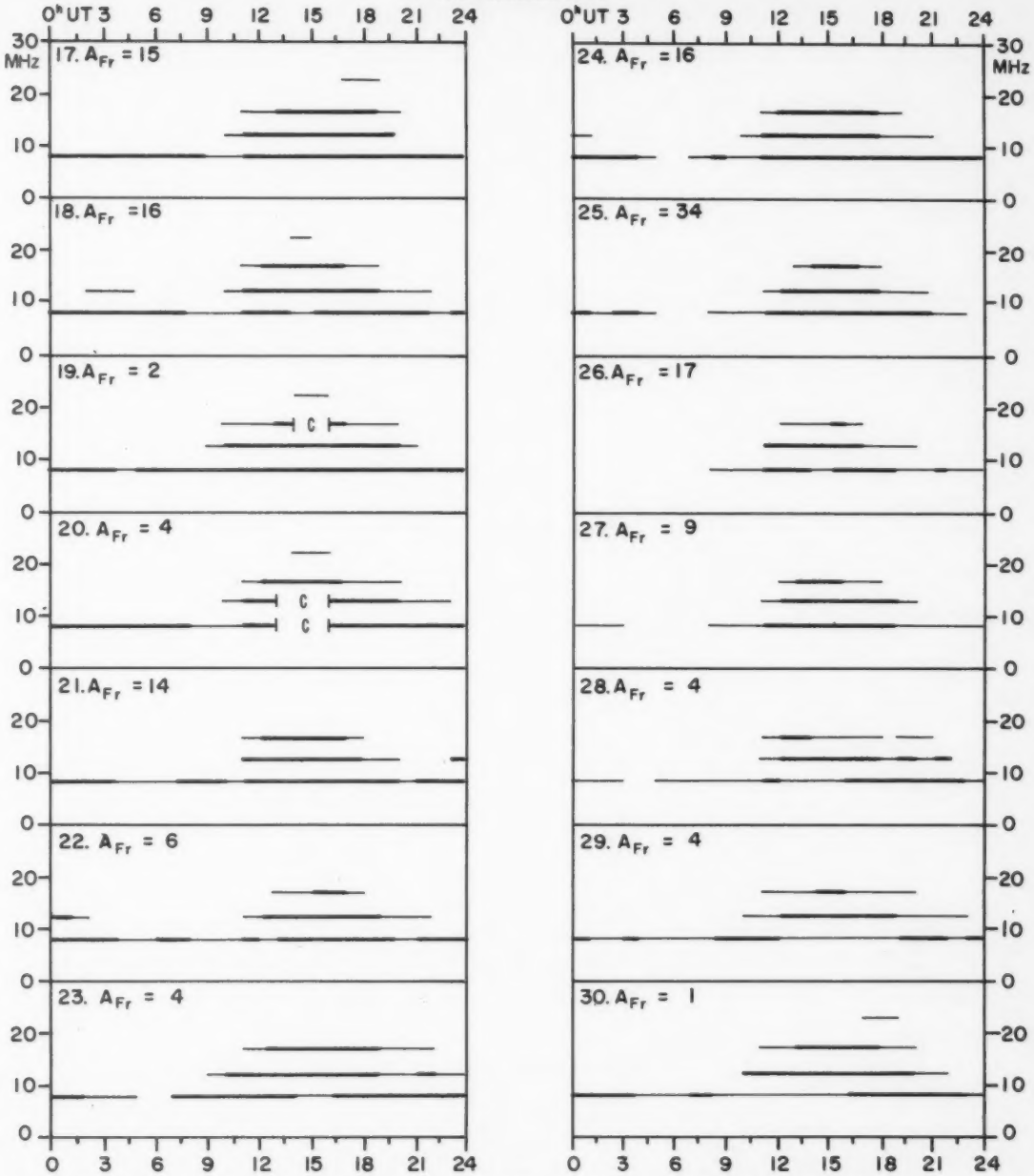
TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

NOVEMBER 1973



TRANSMISSION FREQUENCY RANGES -- NORTH ATLANTIC PATH

NOVEMBER 1973



Field strengths from four frequencies, 8.542, 12.813, 17.084 and 22.378 MHz, as observed on a Lüchow - Halifax circuit are represented above. Heavy solid lines represent field strengths ≥-12 dB above 1 μv/m (transmitter power reduced to 1 kW). Observed field strengths between -12 dB above 1 μv/m and -40 dB above 1 μv/m are represented by the fine line.

Adapted from Observations by Deutsche Bundespost

RADIO PROPAGATION QUALITY INDICES

NOVEMBER 1973

Calculated from the records of four frequencies
on the circuit Lüchow - Halifax (Germany - Canada)

Date	Day	Night	D+N
1	6.6	4.2	5.2
2	6.4	4.6	5.2
3	4.5	3.9	4.1
4	4.0	4.4	3.9
5	5.4	4.1	4.6
6	5.2	4.2	4.6
7	3.8	3.6	3.5
8	5.0	3.7	4.2
9	3.3	3.4	3.2
10	5.4	3.7	4.5
11	4.6	3.7	4.0
12	4.9	3.5	4.0
13	6.1	3.8	4.8
14	5.0	3.6	4.1
15	4.3	3.9	4.0
16	5.2	3.9	4.5
17	6.2	4.1	5.1
18	4.8	4.1	4.4
19	5.8	3.9	4.7
20	5.9	4.0	4.8
21	4.7	4.0	4.2
22	4.1	3.7	3.7
23	6.0	4.5	4.8
24	5.5	3.1	4.2
25	3.9	2.3	3.0
26	3.4	2.7	2.9
27	3.8	3.1	3.3
28	4.5	4.2	4.0
29	4.2	3.9	3.8
30	5.8	4.1	4.8

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